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ABSTRACT

This student study guide is one of three documents prepared for the Emergency Medical Technician (EMT), National Standard Curriculum. The course is designed to develop skills in symptom recognition and in all emergency care procedures and techniques currently considered to be within the responsibilities of an EMT providing emergency medical care with an ambulance service. The study guide provides an overview of the objectives and content of each course lesson and includes study suggestions to aid trainees in achieving course objectives. The study guide includes a section for each of the 33 course lessons. For lessons in which new skills and knowledge are taught, the following are included: (1) an introductory paragraph describing the purpose and need for the lesson; (2) objectives that students should be able to achieve upon completion of the lesson; (3) an overview of lesson contents, with emphasis on sign and symptom recognition and emergency care procedures; and (4) study suggestions directed largely toward simulation of performance required on the job. A synopsis of the 33 lessons appears in the introduction to the study guide. Appendixes to the guide include the American Heart Association cardiopulmonary resuscitation guidelines, a bibliography, and in-hospital clinical guidelines. (KC)

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U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

Emergency Medical Technician–Ambulance: National Standard Curriculum

Student Study Guide (Third Edition)

1984

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Foreword

The National Highway Traffic Safety Administration has assumed responsibility for the development of training courses that are responsive to the standards established by the Highway Safety Act of 1966 (Amended). Since these training courses are designed to provide national guidelines for training, it is NHTSA's intention that they be of the highest quality and be maintained in a current and up-to-date status from the point of view of both technical content and instructional strategy. To this end, NHTSA supported the current study which involved revision of selected curriculum packages deemed of high value to the States in carrying out their annual work programs. This cause is one of a series of courses making up a National EMS training program for pre-hospital care. This program is a major component of total EMS system development.

The original package of the current training program was prepared in 1969 and was titled "Basic Training Program for Emergency Medical Technician-Ambulance." The training program was revised in 1977 and generally reflected the coverage and design of the original training. A Student Study Guide was developed which was not included as part of the original package. During the revision of the third edition, all three documents have been updated. The current Instructor's Lesson Plans have been updated and expanded to reflect a greater emphasis on the practical application aspects of being an EMT-A as well as to represent the current state of the art in pre-hospital emergency care at a basic life support level. The Course Guide has been updated to reflect the revised program and to be more responsive to the needs of the course coordinator. The Student Study Guide has been revised to parallel the changes in Instructor's Lesson Plans. The material which was previously contained in the DOT Patient Handling manual has likewise been incorporated into the Student Study Guide and Instructor's Lesson Plans along with instruction on the Military Anti-Shock Trousers (MAST).

Since the inception of this training course, the Department of Transportation has worked closely with many consultants to assure the quality of the medical content of this curriculum. Most notably, the American Academy of Orthopaedic Surgeons has contributed substantially to the quality of this endeavor. As early as 1964, the Academy established and conducted training courses for ambulance personnel. From these courses the original National Standard Curriculum was developed along with the Academy's reference textbook, *Emergency Care and Transportation of the Sick and Injured.*

The third edition of this text, published by the Academy in 1981, has served as the primary reference text for the medical content of this curriculum to provide a great deal of new material and to update and refine many of the older concepts.

NHTSA wishes to thank the entire membership of the National Council of State Emergency Medical Services Training Coordinators in the development and review of these materials. Specifically acknowledgement is provided to the following project staff for the National Council of State EMS Training Coordinators who coordinated this revision effort:

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Introduction

This *Student Study Guide* is one of three documents prepared for the *Training Program For Emergency Medical Technicians—Ambulance (EMT-A).* It was designed as a training aid for the student. As such, it provides an overview of the objectives and content of each course lesson and includes study suggestions to aid trainees in achieving course objectives. Two other documents complete the training package: a Course Guide which contains planning and management information required by the course coordinator to administer the training program and an *Instructor's Lesson Plans* document which contains detailed outlines of course content and guidance for teaching each course lesson.

The training course covers all emergency medical techniques currently considered to be within the responsibilities of the basic EMT-A providing emergency care with an ambulance service. The course consists of 33 lessons involving 100 hours of classroom and field training plus 10 hours of in-hospital observation and training. The titles and times required for each of the 33 course lessons are given on the following page. The specified training times are minimal; actual training time (including clinical experiences) is expected to range from the recommended minimum of 110 hours to 140 hours or more depending on individual State program requirements. The purpose of the training is to *Ensure Individual Competency in Each Student* by the successful completion of each objective.

This *Student Study Guide* includes a section for each course lesson. For lessons in which new skills and knowledge are taught, the following are included:

An introductory paragraph describing the purpose and need for the lesson.

Objectives that students should be able to achieve upon completion of the lesson.

An overview of lesson contents—although each overview outlines lesson contents and provides certain specific facts, the emphasis is on sign and symptom recognition and emergency care procedures.

Study suggestions directed largely toward simulation of performance required on the job.

Course Lessons

1. Introduction to Emergency Care Training (3 hrs.) Overview of course objectives, scope, EMT-A roles and responsibilities, legal aspects of emergency care.

2. Anatomy and Physiology and Patient Assessment (3 hrs.) Overview of human systems, including anatomy, physiology and an introduction and practice in patient assessment.

3. Airway Obstruction and Respiratory Arrest (3 hrs.) Basic mechanics of respiration; signs of airway obstruction and respiratory arrest; maintaining an open airway; pulmonary resuscitation; variations for infants, children and laryngectomees.

4. Cardiac Arrest (3 hrs.) Basic mechanics of circulation; signs of cardiac arrest; cardiopulmonary resuscitation by a lone rescuer and by a team of rescuers; variations for infants and children.

5. Manikin Practice and Certification (4 hrs.) This lesson when combined with lessons 3 and 4 should provide the student with sufficient practice to be certified in CPR to American Heart Association Standards.

6. Practical Use of Airway Adjuncts (3 hrs.) Use of airways, suction equipment, oxygen equipment and delivery systems, resuscitation devices. Special considerations in CPR.

7. Bleeding and Shock (3 hrs.) Basic mechanics of circulation; determining blood pressure; signs of shock; preventing shock; treating shock; signs of external and internal bleeding; controlling bleeding; performing an examination for life-threatening problems; taking blood pressure; additional practice on airway care; pulmonary and cardiopulmonary resuscitation; use of mechanical aids to airway care and resuscitation.

8. Test and Evaluation — Airway Care, Pulmonary Arrest, Cardiac Arrest, Bleeding and Shock (3 hrs.) Test of knowledge taught thus far; practice on an evaluation of skills taught thus far.

9. Review of Shock and Introduction to Practical Use of Military Anti-Shock Trousers (MAST) or Pneumatic Counter Pressure Devices. (4 hrs.) This lesson provides a review of shock, indications and contraindications in the use of pneumatic counter pressure devices and provides practice in their application.

10. Soft Tissue Injuries (3 hrs.) Anatomy and physiology of the skin, signs and significance of various wound types, basic care of wounds, dressing and bandaging wounds.

11. Principles of Musculoskeletal Care and Fractures of the Upper Extremity (3 hrs.) Anatomy and physiology of the musculoskeletal system; definitions and types of fractures and dislocations; signs and symptoms of fractures, dislocations and sprains; examining a patient for injuries; techniques of immobilizing fractures and dislocations of the upper extremity.

12. Fractures of the Pelvis, Hip and Lower Extremity (3 hrs.) Signs and symptoms of fractures and dislocations of the pelvis, hip and lower extremity; immobilizing fractures and dislocations of the pelvis, hip and lower extremity; practice in examining a patient for injuries and in the use of pneumatic counter pressure devices.

13. Practical Lab: Fracture Care of the Upper and Lower Extremities (3 hrs.) Practice in the assessment and management of fractures of the upper and lower extremities.

14. Injuries of the Head, Face, Eye, Neck and Spine (3 hrs.) Anatomy and physiology of the nervous system; signs and symptoms of spine fractures; general rules of caring for patients with spine injuries; signs of a skull fracture; caring for patients suffering from injuries to the skull, brain, face, eye and neck; practice in immobilizing patients on short and long backboards.

15. Practical Lab: Patient Assessment and Spine Immobilization (3 hrs.) Practice of patient assessment techniques and in the recognition and treatment of spine injuries.

16. Injuries to the Chest, Abdomen and Genitalia (3 hrs.) Parts and functions of the abdomen, digestive system and genitourinary system; chest, abdomen, and genitalia; techniques of care; dressing and bandaging the chest; practice in performing a complete patient examination for life-threatening problems and injuries.

17. Practical Lab: Injuries I (3 hrs.) Practice in the recognition and treatment of injuries to various body parts including: performing a patient examination, use of pneumatic counter pressure devices, dressing and bandaging, spine immobilization and fracture immobilization.

18. Test and Evaluation: Injuries II (3 hrs.) Written and practical examination covering "the recognition and treatment of injuries to various body parts including: performing a patient examination, use of pneumatic counter pressure devices, dressing and bandaging, spine immobilization and fracture immobilization."

19. Medical Emergencies I (3 hrs.) Causes, signs, symptoms and techniques of care for poison victims; victims of bites and stings; heart attack patients; stroke patients; patients suffering from dyspnea. Practice in CPR and mechanical aids to resuscitation.

20. Medical Emergencies II (3 hrs.) Causes, signs, symptoms and techniques of care for diabetic patients, patients suffering from acute abdominal problems, patients with communicable diseases, poisoning, patients having seizures, pediatric patients, practice in patient assessment.

21. Emergency Childbirth (3 hrs.) Relevant anatomy, physiology, terms and emergency care equipment; delivery and care of the baby and mother during normal and abnormal births; resuscitating the newborn; care of the premature infant, practice in simulated deliveries.

22. Burns and Hazardous Materials (3 hrs.) Estimating the degree and size of a burn, caring for the burned patient; special dangers of different types of burns (heat, chemical, electrical, radiation), identification and recognition of hazardous materials situation and proper precautionary procedures.

23. Environmental Emergencies (3 hrs.) Signs, symptoms and techniques of care for the patient suffering from heat cramps, heat exhaustion, heat stroke, hypothermia and frostbite; signs, symptoms and techniques of care for the patient exposed to water related emergencies.

24. Psychological Aspects of Emergency Care (3 hrs.) Considerations when dealing with special patients: infants, children, elderly, handicapped, psychologically disturbed; patients displaying abnormal behavior, substance abuse patients, dealing with death and dying and emotional aspects of providing care as an EMT-A.

25. Lifting and Moving Patients (3 hrs.) Techniques of lifting and moving patients; immobilizing patients with suspected spine injuries on short and long backboards; loading and unloading stretchers; review of triage.

26. Principles of Extrication (3 hrs.) Principles and considerations involved in gaining access to and extricating persons from inaccessible situations, packaging and removing patients with suspected spine and other injuries; removing patients from beneath vehicles.

27. Practical Lab: Extrication (3–8 hrs.) Practice in patient assessment, treatment and removal of patients from motor vehicles and other inaccessible situations.

28. Test and Evaluation — Medical Emergencies, Emergency Childbirth, Environmental Emergencies, Lifting and Moving (3 hrs.) Test of knowledge and skills of medical emergencies, emergency childbirth, environmental emergencies, psychological aspects, and lifting and moving patients; extrication.

29. Ambulance Operations I (3 hrs.) Overview of regulations and recommendations pertaining to driving an emergency vehicle, provide an understanding of all records and reporting systems and forms utilized by the EMT-A and promote efficient and proper use of all radio communications equipment and systems the EMT-A will utilize.

30. Ambulance Operations II (3 hrs.) Provide an overview of such aspects of EMT responsibilities as: vehicle and equipment maintenance, emergency department procedures, scene control, special scene situations (crime, death, etc.), disaster planning and other non-medical functions during a typical ambulance run.

31. Situational Review (3 hrs.) Review of course contents by group discussion of situational examples.

32. Final Written Test (2 hrs.) Test of knowledge learned.

33. Final Practical Evaluation of Skills (3 hrs.) Evaluation of skills learned in the emergency care course.

Lesson 1
Introduction to Emergency Care Training

Introduction

The EMT typically represents one of the first components of the emergency medical care system. With proper training, he will be able to provide basic life support to victims of emergencies as well as minimize discomfort and further injury. This course has been designed to provide that training. This introductory lesson provides an overview of the EMT-A training course, EMT-A roles and responsibilities on legal problems relative to emergency care.

Objectives

At the conclusion of Lesson #1, the instructor will have provided sufficient information, demonstration, and practice to the student to ensure his/her ability to:

—Describe in their own words the goal of the EMT-A National Standard Curriculum.

—List 4 contributing agencies in your local EMT-A system.

—Describe the mechanism for accessing your local EMS system.

—List 6 roles and responsibilities of the EMT-A.

—List 6 areas of personal attitude and conduct expected of an EMT-A.

—List 3 medico-legal aspects of emergency medical care.

—Describe State requirements for EMT-A certification and recertification.

Overview of Lesson Contents

Course Overview

The course emphasizes emergency medical care skills and attempts to teach these skills in a job-related context. The following *Medical Conditions* are included: inadequate airway, cardiac arrest, external and internal bleeding, shock, injuries to all body parts, fractures, dislocations, sprains, poisons, heart attack, stroke, diabetes, acute abdomen, communicable diseases, patient with abnormal behavior, alcohol and drug abuse, the unconscious state, emergency childbirth, burns (chemical, electrical heat and radiation), emergencies caused by hot and cold environmental conditions and emergencies resulting from water hazards. In addition, the program includes training in the use of the following *Equipment and Materials:* suctioning devices, airways, bag-mask resuscitation devices, oxygen equipment and delivery systems, sphygmomanometer and stethoscope, splints of all types (including backboards), and bandages.

Lesson 1 introduces the student to the course and to the emergency medical technician's role and responsibilities. Three lesson blocks or modules comprise the bulk of the course:

—Lessons 2–8 on patient assessment and basic life support.

—Lessons 9–18 on injuries to various body parts.

—Lessons 19–28 on common medical emergencies, emergency childbirth, environmental emergencies, techniques of lifting and moving patients, extrication, and field practice in "packaging" individuals with suspected spinal and other injuries.

Each of these lesson blocks has its own practice, test, and evaluation sessions. The operational aspects of the EMT's job is covered in Lessons 29 and 30. A review of field situations that could be encountered by the EMT is presented in Lesson 31. The course concludes with a written test of knowledge (Lesson 32) and a practical evaluation of skills (Lesson 33). The course provides for an early and continuing emphasis on patient assessment as well as reinforcement of the basic sequence of emergency care procedures.

Role and Responsibilities of the EMT.

Careful examination of the patient for signs and symptoms of illness/injuries.

Prompt and efficient care of the patient.

Careful handling of the patient.

Safe and efficient transport of the patient.

Orderly transfer of the patient to the hospital.

Additional responsibilities include:

Use basic tools and procedures to gain access to and disentangle the patient from the vehicle.

Control the accident scene, including parking his vehicle in such a way as to minimize further danger in the roadway as well as controlling the actions of bystanders.

- Communications.
- Reporting and recordkeeping.
- Vehicle driving, maintenance and care.

The EMT-A will need to learn a good deal about the area in which he provides services.

Personal Attitudes and Conduct of the EMT.

- Professional manner.
- Appearance.
- General conduct.

Legal Problems Relative to Emergency Care.

Duty to act.

Standard of care including:

- The type of individual and community conduct.
- Standards imposed by force of law and
- Professional or institutional standards.

Consent, including:

- Actual consent.
- Implied consent.
- Minor's consent and
- Consent of the mentally ill.

Immunities including:

- Government immunities.
- Good samaritan laws.
- EMT and paramedic statutes.
- Exemption from medical practices act and
- Effects of licensure and certification.

Overview of Requirements for Training, Certification and Recertification.

- Training.
- Certification.
- Recertification.
- Other requirements as indicated.

Study Suggestions

1. List the 5 main roles and responsibilities of an EMT-A.
2. List three reasons why you wish to become an EMT-A.

Lesson 2
Anatomy, Physiology and Patient Assessment

Introduction

Patient assessment is an integral part of the skills an EMT-A needs to provide prompt and efficient patient care. In order to conduct a patient examination the EMT-A must have a thorough understanding of anatomy, physiology, medical terminology and vital signs. These topics are only introduced in this lesson and will be reinforced throughout the course.

Objectives

At the conclusion of Lesson #2, the instructors will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

—Define the following topographic anatomical terms:

- medial
- distal
- anterior
- right
- lateral
- superior
- posterior
- left
- proximal
- inferior
- midline

—Describe the general functions of the following major body systems:

- respiratory
- circulatory
- muscular
- skeletal
- nervous
- digestive
- genitourinary
- reproductive

- List the 4 patient vital signs.
- List 5 diagnostic signs in addition to the vital signs.
- Demonstrate on a programmed patient the technique for completing a total patient assessment and identify and record diagnostic signs and their normal states.
- Record and communicate in proper sequence, their patient assessment information.
- State the difference between a sign and symptom.

Overview of Lesson Contents

Overview of Anatomy and Physiology.

Skeletal system and body cavities. The skeletal system consists of the bones that form the support framework of the body; they also protect body organs.

Skull.
Spinal column.
Thoracic (rib) cage.
Abdominal cavity.
Pelvic cavity.
Upper extremeties.
Lower extremities.

Muscular system. The muscular system consists of the tissue that contracts and relaxes to permit body movement or functions.

Voluntary muscles.
Involuntary muscles.
Cardiac muscle.

Nervous system. The nervous system consists of the brain, spinal cord and nerves that control and permit all body activities and sensations. A muscle will not move if the nerves which serve it are cut.

Respiratory system. The respiratory system consists of the organs of the body which enable breathing. It provides for the intake of oxygen needed by the body and the release of carbon dioxide and other substances. Main elements are:

a. Nose and mouth
b. Pharynx
c. Larynx
d. Trachea
e. Bronchi
f. Lungs

Circulatory system. The circulatory system consists of the heart (a pump) and a system of arteries which transport blood containing oxygen to all body systems, capillaries through whose thin walls oxygen and other products are exchanged with body cells, and veins which transport blood containing waste products from body cells to be eliminated.

Digestive system. The digestive system consists of the organs which enable us to eat, digest, and eliminate foods, including:

a. Mouth and throat
b. Esophagus
c. Stomach
d. Liver
e. Gallbladder
f. Pancreas
g. Intestines
h. Rectum

Genitourinary system. The genitourinary system consists of the organs which enable us to eliminate certain waste materials filtered from the blood and to reproduce, including:

a. Kidneys
b. Ureter
c. Urethra
d. Bladder
e. Male and female reproductive organs.

Topographic Anatomy

Right
Left
Anterior
Posterior
Midline
Proximal
Distal
Superior
Inferior

Diagnostic Signs

A **Sign** is something the rescuer sees, hears or feels; for example a pale face, no respirations, cold skin.

A **Symptom** is something the patient tells about himself, that is, he feels nauseous, his back hurts, he has no sensation in the extremities.

Use in Diagnosis.

Overview of Signs. A brief overview of the important diagnostic signs is given below:

Pulse

The pulse can be:

Absent
Slow or fast
Weak or pounding
Irregular

Respirations

Respirations can be:

- Absent
- Slow or fast
- Shallow or deep
- Gasping, labored, or choking

Blood Pressure

Systolic—contraction of heart
Diastolic—relaxation of heart

Blood pressure

- Can be high
- Can be low
- Can fall rapidly

Temperature

Normal body temperature is 98.6 degrees.

The skin can be:

- Cold or hot

- Wet, clammy or dry

Skin Color

Skin color can be:

- White, pale or ashen
- Red or flushed
- Blue (for people with dark pigmentation, blue may be noted around the fingernails, palms of hands, and mouth)

Pupils of the Eyes

The pupils can be:

- Dilated
- Constricted
- Unequal
- Fixed

Level of Consciousness

A person's level of consciousness may range from normal to mildly confused, disoriented, or unconscious.

Inability to Move On Command—an indicator of paralysis.

A person may not be able to move his legs, both his arms and his legs, or one side of his body.

Reaction To Pain—an indicator of paralysis.

A person may have no sensation or a numb feeling in arms and/or legs or certain parts of the body.

Medical Identification Symbols

People with special medical problems (for example, diabetes, epilepsy, acute allergic reactions) frequently wear a medical identification symbol on which the nature of the problem is indicated.

Patient Survey

Stages. At the emergency scene, patient examination must be performed. It is performed in two stages:

Checking for and controlling life-threatening problems—the primary survey.

Checking for the stabilizing injuries not threatening to life.

Level of Consciousness

Respirations

Pulse

Bleeding/Shock

Secondary Survey. In the secondary survey, the EMT makes a head-to-toe examination of the patient.

The EMT should always observe the accident scene and check witnesses to attempt to determine any mechanism of injury.

Head

Observe for confusion, unresponsiveness, unconsciousness.

Check pupils.

Observe for lacerations and contusions about the face and scalp.

Feel gently for depressions in the skull.

Check ears and nose for fluid intake.

Check mouth for foreign objects, bleeding.

Neck

Observe for cuts, bruises, deformities.

Feel for areas of tenderness, deformities.

Chest

Check for bruises, pain, deformities.

Check that both sides of the chest expand normally upon inspiration.

Back and Buttocks

Check for cuts, bruises, pain, deformities.

Abdomen and Pelvis

Check abdomen for tenderness, rigidity.

Compress pelvis gently.

Upper Extremities

Check for cuts, bruises, pain, deformities, unusual positions.

Check for sensation.

Ask patient if he can move arms.

Lower Extremities

Check for cuts, bruises, pain, deformities, unusual positions.

Check for sensation.

Ask patient if he can move his legs.

Medical Alert Symbols

Check for tags, bracelets, etc.

Interview

Obtain pertinent medical history.

Note mechanism of injury.

Information on current medical problems.

Vital Signs

Obtain and record

May occur elsewhere during the exam dependent upon patient's condition.

Repeat and record at regular intervals.

Study Suggestions

1. Describe what you expect to be able to do as a result of successfully completing the course.

2. There is a big gash in the patient's arm and it is bleeding severely. The patient refused treatment even though he appears weak and about to faint. Explain what you would do and why.

3. Identify the body system to which each of the following belongs and explain the function of each system: heart, stomach, uterus, lung, skull, biceps, muscle, spinal cord.

4. Is a flushed face a sign or a symptom? Why?

5. Describe the position of the thumb relative to the wrist.

6. Describe the position of the heart relative to the stomach.

7. Describe the position of the chest relative to the back.

8. The accident victim has no visible wounds and says he is feeling all right. Describe the signs you would check and what you would expect to find if the patient's condition is normal.

Lesson 3
Airway Obstruction and Respiratory Arrest

Introduction

All living cells of the body require oxygen to survive. For cells in the brain and nervous system, oxygen is particularly important; without oxygen, they may die in 4 to 6 minutes. It is the respiratory system that provides the means by which oxygen enters the body and carbon dioxide and other waste gases are removed. A non-breathing person or a person with breathing difficulties is a true emergency. Speedy recognition of the patient's problem and prompt and correct performance of the skills taught in this lesson may mean the difference between life and death to the patient.

Objectives

At the conclusion of Lesson #3, the instructor will have provided sufficient information, demonstration and practice to the student, to ensure his/her ability to:

- Describe in narrative the significance of oxygen to body tissues, particularly the brain.
- List 5 components of the respiratory systems and the functions of each.
- List 3 signs of adequate air exchange.
- Demonstrate on a manikin, designed for CPR 5 airway management techniques.
- Demonstrate on a manikin, designed for CPR the AHA method of clearing an obstructed airway in the following situations:
  - Conscious adult
  - Adult who becomes unconscious
  - Unconscious adult
  - Conscious infant
  - Unconscious infant

Overview of Lesson Contents

The Respiratory System.

Anatomy and Physiology.

Pharynx. Air entering the nasopharynx or oropharynx or food entering the mouth passes to the pharynx.

Trachea. The trachea (in front) takes air to the lungs and is known as the windpipe.

Epiglottis. A valve called the epiglottis guards the opening of the trachea.

Larynx. The larynx is the first part of the trachea.

Bronchi. The trachea divides into two smaller tubes, the right and left bronchi, which enter the lungs.

Lungs. In the lungs, the bronchi branch into smaller parts until they finally end in millions of tiny air sacs, called alveoli.

Diaphragm. The diaphragm is a muscle that separates the chest cavity from the abdominal cavity and aids in breathing.

Pleura. The layer of slippery tissue covering the lungs is known as the pleura. A layer of this tissue also lines the chest cavity. In between is a thin layer of fluid.

Control of Breathing. Breathing is controlled by the brain.

Signs

Adequate Breathing. Chest and abdomen RISE and FALL as air is breathed in and out.

Inadequate Breathing

No air can be heard or felt at the nose and mouth,

The breathing is noisy,

The breathing is slow or

The patient is cyanotic.

Opening The Airway

Obstruction By The Tongue. In an unconscious patient, muscles relax and the tongue can fall back and obstruct the airway.

Techniques Of Care.

Head-Tilt Chin Lift Maneuver.

Head-Tilt Neck Lift Maneuver.

Coma Position.

Note: These techniques should not be used if a broken neck or upper spinal cord injury is suspected.

Need For Pulmonary Resuscitation. If breathing does not start spontaneously, artificial respiration should be started immediately.

Suspected Spine Injuries

Problem

A cervical spine injury must be suspected in all accident cases.

Hyperextension of the neck and any movement of the head must be avoided in order to prevent further injury to the spine.

Technique. Modified Jaw Thrust.

Pulmonary Resuscitation.

Oxygen In Inhaled And Expired Air.

The atmosphere contains about 21% oxygen.

Of the 21% inhaled, 5% is used by the body and the remainder (16%) is exhaled.

Mouth-To-Mouth Technique. Procedures are:

Establish unresponsiveness,

Open the airway,

Establish breathlessness,

Pinch the nose closed using thumb and index finger of hand

Open mouth widely, take a deep breath, make a tight seal around the patient's mouth, and blow air into the patient's mouth until the chest rises.

Remove the mouth to allow air to come out.

To start, give four breaths in rapid succession.

Ventilate the lungs 12 times per minute for an adult.

Mouth-To-Nose Technique.

May be needed because of severe injury in the mouth region.

The rescuer may not be able to make a tight seal because the patient has a large mouth, no teeth, etc.

Procedures are:

Establish unresponsiveness

Tilt the patient's head back.

Establish breathlessness

Use the other hand to lift the patient's lower jaw: this seals the lips.

Take a deep breath, seal the lips around the patient's nose and blow until the chest rises.

Remove mouth and let patient exhale.

If necessary, open patient's mouth during exhalation.

Give four deep and quick breaths to start and then repeat cycle every 5 seconds as with the mouth-to-mouth technique.

Variations For Infants. Procedures for infants and small children are:

Do not exaggerate the head tilt.

Make a seal around BOTH mouth AND nose.

Use less volume to inflate the lungs.

Inflate lungs once every 3 seconds.

Variations With Jaw Thrust Maneuver.

For mouth-to-mouth resuscitation, use the cheek to seal the nose.

For mouth-to-nose resuscitation, use the cheek to seal the mouth and do not retract the lower lips with the thumbs.

Gastric Distention. Artificial ventilation frequently causes distention of the stomach.

Slight distention should be ignored.

If there is marked distention causing ineffective air exchange, moderate pressure should be exerted by one hand between the navel and the rib cage after rolling the patient onto his side.

If the patient vomits, sweep or suction the mouth and continue.

The Laryngectomee. (Neck Breather)

The Condition. Some persons have all or part of their larynx removed through surgery.

These persons have a hole (known as a stoma) in the trachea through which they breathe.

Airway Care Procedures. Remove all coverings (e.g., scarves, ties, necklaces) from the stoma area.

Clear the stoma of foreign matter.

Make a seal with your mouth over the stoma and blow until the chest rises.

When the chest rises, remove your mouth from the stoma and permit the chest to fall.

Airway Obstruction

Importance Of Ventilating Lungs First. Efforts to ventilate the lungs will reveal whether foreign bodies are present.

Loose Material. Foreign material (blood, mucus, loose teeth, food, etc.) in the airway can prevent successful ventilation of the lungs. If attempts at ventilation are unsuccessful, the EMT-A should:

Turn the patient's head or entire body to one side.

Force the mouth open by the "cross finger" technique.

Sweep the index and middle fingers of the other hand across the back of the patient's throat.

Roll head back and attempt artificial ventilation.

Note: If a spine injury is suspected, the EMT should maintain the patient's head, neck and torso in strict alignment.

Lodged Material

If the patient is choking from a foreign object caught in his throat, emergency care procedures include back blows and manual thrusts.

BACK BLOWS. The EMT-A should deliver four sharp blows with the heel of the hand to the patient's spine between the shoulder blades.

NOTE: Infants and small children should be picked up, and inverted over the EMT's arm. The EMT should deliver light blows between the shoulder blades.

Abdominal Thrust Procedures. The EMT should:

Stand behind the patient.

Grasp one fist with the other hand and place the fist, thumbside, against the patient's abdomen, slightly above the navel and below the xiphoid.

Press the fist into the patient's abdomen with a quick inward and upward thrust.

Note: Do not use on infants.

Variation. The technique can be performed on a supine patient by placing one hand on the other, placing the heel of the bottom hand on the abdomen as above, and pressing into the abdomen with a sharp inward and upward thrust.

Chest Thrust. The chest thrust can be used when the patient is an infant, markedly obese or pregnant or if abdominal thrusts prove to be ineffective.

Procedure. The EMT should:

Stand behind a standing or seated patient.

Grasp one fist with the other hand and place the fist, thumbside, against the lower sternum above the xiphoid.

Press the fist into the patient's chest with a quick backward thrust.

Variation. For a supine patient, the EMT should:

Place the hands in the correct position for CPR and deliver compressions in the same manner.

Combined Procedures

Conscious Adult Procedures.

Identify complete obstruction.

Alternate 4 back blows and 4 manual thrusts until effective or patient loses consciousness.

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Lesson 4
Cardiac Arrest

Introduction

The circulatory system provides the means by which oxygen and other nutrients are distributed to body cells and carbon dioxide and other waste products are removed. As with the previous lesson, cardiac arrest represents a true emergency. Speed in the recognition of the patient's problem and prompt and correct performance of the skills taught in the lesson may mean the difference between life and death to the patient.

Patient Becomes Unconscious.

Place patient supine.

Call for help.

Open airway: attempt ventilation; if unsuccessful:

Activate EMS system.

Give 4 back blows.

Perform 4 manual thrusts.

Check for foreign body-and sweep with finger.

Attempt ventilation and repeat as necessary.

Patient Found Unconscious.

Establish unresponsiveness.

Call for help.

Open airway; establish breathlessness.

Attempt to ventilate.

If unsuccessful, reposition head and try again.

Activate EMS system.

Give 4 back blows.

Perform 4 manual thrusts.

Check for foreign body and sweep.

Attempt ventilation and repeat as necessary.

Study Suggestions

1. Describe how you would check a patient for signs of adequate breathing.
2. Describe how you would resuscitate a patient with a badly swollen tongue.
3. Describe what you might suspect if a patient's chest appears to be moving normally but no exhaled air can be felt at nose and mouth.
4. Practice the five techniques of opening the airway. Use a classmate or friend as a "patient".
5. Practice opening your own mouth using the cross-finger technique.
6. Practice correct positioning of your hands and body for performance of the abdominal and chest thrusts on a standing/seated and supine patient. Use a classmate or friend as a "patient". Do NOT perform the actual thrusts.
7. Practice THE STEPS involved in dislodging a foreign object in the airway for conscious and unconscious patients. Use a classmate or friend as a "patient". Simulate procedures; DO NOT perform actual maneuvers.
8. If an adult manikin is available, practice mouth-to-mouth and mouth-to-nose pulmonary resuscitation. If a manikin is not available, simulate performance of the skills on a classmate or friend as follows:

   Establish unresponsiveness.

   Properly position your hands and fingers on the "patient."

   Open your mouth an appropriate amount and start the ventilation process by delivering INTO THE AIR the proper number of breaths at the proper volume.

   Maintain ventilation at the proper rate and volume. Have the "patient" time your ventilations.

9. When an infant manikin is available, practice the steps involved in pulmonary resuscitation.

10. Practice sealing the nose and mouth of a partial neck breather. Use a classmate or friend as a "patient".

Objectives

At the conclusion of Lesson #4, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- List 4 components of the circulatory system and the function of each
- List 2 specific signs of cardiac arrest.
- List 3 possible complications of CPR.
- List 3 instances when CPR, once initiated, may be terminated.
- Demonstrate on a manikin, the current AHA sequences and techniques for the following CPR cases:
  - —single rescuer (adult and infant)
  - —team rescuer (adult)
  - —infant and adult CPR while transferring to an ambulance

Overview of Lesson Contents

The **Circulatory System** consists of the heart and a series of tubes that carry blood throughout the body.

The tubes include:

Arteries that carry blood rich in oxygen.

Veins that carry deoxygenated blood and waste products.

Capillaries through which oxygenated and deoxygenated blood are exchanged with the body cells.

In combination with the respiratory system, the circulatory system serves to provide the body with the oxygen needed for life.

The Heart

Design Of The Heart. The heart is a muscular organ approximately the size of a man's clenched fist.

A wall (septum) divides the heart into two upper chambers (atria) and two lower chambers (ventricles).

The Heart As A Two-Sided Pump

The left side of the heart receives oxygenated blood from the lungs and pumps it out to all body parts through a system of arteries.

The right side of the heart receives from the veins blood that has circulated through the body and pumps it to the lungs to be re-oxygenated.

A system of one-way valves keeps blood moving in the proper direction and prevents backflow of the blood.

The heart is located in the chest cavity under the sternum and the lungs. Pressure on the sternum will compress the heart and produce an artificial circulation.

The liver and spleen are located below the heart—the liver to the right and center and the spleen to the left.

Laceration of the lungs, liver or spleen could prove fatal to the patient. It is therefore especially critical that the skill learned in this lesson be learned correctly.

Signs Of Cardiac Arrest

The patient is not breathing.

The patient has no carotid pulse.

Technique Of Cardiopulmonary Resuscitation.

General Procedures.

Place patient on a firm surface, such as the ground or a spine board: CPR cannot

be performed with the patient in a sitting position.

Adequately ventilate the lungs with oxygen since compression without ventilation is useless.

Locate the hands on the lower half of the sternum avoiding the xiphoid process. Use sternal notch to locate position.

Place the heel of one hand on top of the other, with fingers raised so that no contact is made with the ribs.

Lean over the patient with elbows straight so that the weight of your body is assisting in compression of the sternum.

For an adult, compress the sternum about 1½ to 2 inches vertically downward. Compressions should be 50% compression 50% relaxation.

Compress the sternum approximately 80 times per minute for single rescuer and 60 times per minute for team rescuer.

One-Rescuer Technique

Establish unresponsiveness.

Call for help.

Assure an open airway.

Establish **BREATHLESSNESS.** Look, listen and feel.

Ventilate the lungs quickly 4 times.

Check Carotid pulse.

Activate EMS system.

Perform 15 compressions with 2 quick and full ventilations.

Stop compression and give 2 quick full ventilations.

Alternate 15 compressions with 2 quick and full ventilations.

Recheck Pulse after 1 minute.

Two-Rescuer Technique.

Establish Unresponsiveness.

Call for help.

Ventilator assures an open airway.

Establish Breathlessness.

Ventilator ventilates the lungs quickly 4 times.

Check carotid pulse.

Second rescuer performs 5 compressions of the sternum at the rate of 60 per minute. Counting "One-One-thousand", "Two-One thousand", "Three-One thousand", etc., will aid the rescuer in maintaining a rate of one compression per second.

Ventilator interposes one breath after each 5 compressions.

Changing Positions. Compressor calls for a switch when needed. Ventilator gives breath on 5th count and moves to chest. Compressor checks pulse, ventilates and signals to begin.

Infants And Children

For small children 1 to 8 years, only the heel of one hand is used and the compression should be 1 to 1½ inches, 80 per minute.

For infants, less than 1 year, only the tips of the index and middle fingers are used and the compression should be one-half to 1 inch. 100 per minute. Use brachial pulse check.

Pressure should be exerted over the mid-sternum.

Additional support beneath the back will be required for infants and small children.

Second Rescuer Entering.

Single rescuer CPR initiated.

The Second rescuer appears and identifies self.

Second rescuer checks pulse for effective compressions.

Second rescuer calls for stop to check for spontaneous return of pulse.

Begins two rescuer CPR.

Signs Of Effective CPR

A carotid pulse can be felt (when working as a team, the ventilator should feel a pulse with each compression).

The pupils constrict when exposed to light.

The skin color improves.

There may be spontaneous gasping respirations.

There may be spontaneous movement of the patient's arms or legs.

The heart may resume normal beating.

Note: CPR produces a pumping activity that is only 25% to 33% as effective as the action of a normal heart. Thus oxygen should be delivered to all patients who have sustained a cardiac arrest as soon as it is available.

CPR should not be interrupted for more than 5 seconds unless it is necessary to move a patient up and down a stairway. Such interruptions should not exceed 15 seconds.

Complications:

Fractured ribs.

Fractured sternum.

Lacerations of the liver, spleen, lungs or heart.

Damage to the pleura resulting from broken ribs.

Beginning And Terminating CPR

CPR is not indicated for a patient known to be in the terminal stages of an incurable condition, if signed physician orders are present.

Once started, CPR should be terminated only when one of the following occurs:

The patient's heart resumes normal beating.

A physician or other properly trained person responsible for emergency medical services assumes responsibility for the patient.

The rescuer is exhausted and unable to continue.

The patient is pronounced dead by a physician, coroner or other individual with the legal authority to do so.

Study Suggestions

1. Describe how you would check a patient for cardiac arrest.
2. Explain what you could do if you saw a rescuer attempt to perform CPR with his hands placed over the xiphoid process. Give the reasons for your actions.
3. You have started cardiopulmonary resuscitation and suddenly suspect that the patient has a broken rib on his right side near the sternum. Explain what you would do and why.
4. When an adult manikin is available, practice one-man cardiopulmonary resuscitation.
5. When an adult manikin is available, practice the steps involved in two-man cardiopulmonary resuscitation with a classmate.
6. When an infant manikin is available, practice the steps involved in cardiopulmonary resuscitation of an infant.

Lesson 5
Manikin Practice and Certification

Introduction

As mentioned previously the absence of breathing or circulation will lead to the death of the patient. Prompt and efficient intervention must be completed by the EMT-A.

Objectives

At the conclusion of Lesson #5, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

—Certify to current AHA standards in all areas required of a CPR-Basic Rescuer.

Overview Of Lesson Contents

Basic rescuer certification including:

Written exam
One rescuer CPR
Two rescuer CPR
Infant CPR
Adult obstructed airway procedures
Infant obstructed airway procedures.

Study Suggestions

1. Review all material covered in lessons 3 and 4.
2. Review American Heart Association performance standards.
3. Practice all procedures on appropriate manikins until proficiency is attained.
4. List the proper performance sequences for each skill.

Lesson 6
Practical Use of Airway Adjuncts

Introduction

A patient can be given basic life support without the use of mechanical aids. In many cases, however, airway adjuncts make airway care and ventilating easier and more effective. If oxygen is required, such aids are a necessity. EMT's must be thoroughly knowledgeable about the design and use of the equipment available to them.

Objectives

At the conclusion of Lesson #6, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

—List the indications, purpose and functions of the following airways:

Oropharyngeal airways

Nasopharyngeal airways

Portable suction

Oxygen equipment and delivery systems: nasal cannula, simple face mask, venturi mask, etc.

Pocket valve mask

Bag valve mask

—Demonstrate on manikin the correct sequence and techniques for using the following airway adjuncts in stationary and moving patient circumstances:

Oropharyngeal airways

Nasopharyngeal airways

Portable suction

Oxygen equipment and delivery systems: nasal cannula, simple face mask, venturi mask, etc.

Pocket mask system

Bag valve mask system.

Overview Of Lesson Contents

Oropharyngeal Airways

Oropharyngeal airways can be used in sizes to maintain an open airway on unresponsive patients.

Procedures of inserting the airway are as follows:

Select proper size: corner of mouth to earlobe.

Open the patient's mouth using the cross-finger technique.

Insert airway with the tip facing upward (toward the roof of the patient's mouth).

After contact with soft palate, rotate it 180 degrees and insert it until the flange rests on the lips or teeth (the curve of the airway follows the patient's tongue.)

Nasopharyngeal Airways.

A nasopharyngeal airway is not likely to stimulate vomiting and nasopharyngeal may be used on a conscious patient who cannot maintain an open airway.

Select the proper size measured from the nose to earlobe.

Lubricate the airway.

Insert it through a nostril following the floor of the nose until the flagne rests against the nostril.

Suction Unit

A suction unit permits removal of blood and other liquid materials from the airway.

Procedures for use are:

Inspect unit to insure that all parts are assembled.

Switch on suction, clamp tubing and assure that pressure dial registers over 300 mm Hg.

Attach flexible catheter or rigid tonsil sucker.

Open the mouth with the cross-finger technique.

Insert the catheter into the pharynx. Length of insertion is the distance from mouth to lobe of ear. Insert rigid tonsil sucker with convex side along the roof of the mouth until the pharynx is reached.

Apply suctioning only after catheter is in position.

Suctioning should not exceed 15 seconds.

Oxygen

Patients Needing Oxygen Include:

PATIENTS SUFFERING A CARDIAC ARREST and others whose condition results in a lack of oxygen being delivered to the organs.

Dangers Of Oxygen Use:

Oxygen supports combustion.

In some chronic diseases states like emphysema, administration of oxygen can decrease respiration since, in these patients, a low blood oxygen level is the stimulus for respiration. Avoid cylinder or regulator contact with petroleum products.

Oxygen Equipment

Oxygen is usually supplied as a compressed gas in seamless steel or alloy cylinders.

Thus the cylinders are designed so that an oxygen line or regulator cannot mistakenly be attached to a cylinder of another compressed gas.

Pressurized cylinders must be handled carefully since their contents are under pressure.

Pressure of a full oxygen cylinder will be 2000 to 2200 psi; it must be reduced to 40 to 70 psi before administration to a patient.

Flowmeters are typically permanently attached to the pressure regulator; they permit oxygen to be delivered to the patient at the desired rate.

Since oxygen in a compressed cylinder is an extremely dry gas, a humidifier should be attached to the flowmeter to prevent excessive dryness of the patient's mucous membranes if prolonged administration of oxygen is anticipated.

Operating Procedures. The EMT should:

Remove protective cap.

"Crack" the valve.

Attach regulator-flowmeter.

Attach humidifier.

Reduce the pressure.

Regulate the flow.

Connect administering apparatus.

Shut down the apparatus.

Equipment For Oxygen Delivery

Methods of oxygen delivery include:

Nasal Cannula. **Mask and Bag.**

Facemask. **Venturi Masks.**

Each type of delivery device has specific advantages and limitations.

Equipment For Ventilation And Oxygen Delivery

Pocket-Mask With Oxygen Inlet Valve System is a ventilation system which permits additional oxygen to be delivered to the non-breathing patient.

It will deliver 50% oxygen at ten liters per minute.

Procedures for use:

Stand behind patient's head and open airway with modified jaw thrust, use oropharyngeal airway.

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Attach oxygen.

Apply the mask to the face with the apex over the bridge of the nose and the base between the lips and chin.

Place your thumbs on dome of mask and hold patient's mandible with remaining fingers.

Maintain an airtight seal with firm pressure between thumb and fingers.

Maintain an open airway by modified jaw thrust.

Breathe through open port in chimney.

Remove mouth and allow patient to exhale passively.

Note: Adult mask may be inverted for use on a child. Infant size mask can be used on the stoma.

Bag-Valve-Mask Resuscitator system, when used with a reservoir permits delivery of high concentrations of oxygen to the patient.

It should be used with an oropharyngeal airway in place.

Procedures for use:

Select correct mask size.

Inflate collar if necessary.

Open airway with cross-finger technique and insert oropharyngeal airway.

Apply mask over the patient's face with its apex over the bridge of the nose and its base between the lower lip and chin.

Hold the mask firmly in position by placing three fingers of one hand on the mandible between the angle and the lobe of the ear while the index finger is held over the lower portion of the mask and the thumb over the upper portion of the mask.

With the other hand, compress the bag fully in a rhythmical manner once every five seconds.

Comments On Use.

Better volumes for ventilation can be delivered by direct mouth-to-mouth resuscitation but supplemental oxygen cannot be provided.

Inadequate tidal volume may be the result of improper seal or incomplete bag compression.

If chest does not rise and color improve in a non-breathing patient, select an alternate method.

Demand-Valve Resuscitator system can be used to assist ventilation or control it.

It can deliver 100% oxygen.

Procedures for use:

Preset pressure initially at 10 to 20 cm H20 or 8 to 15 mm Hg.

Ventilate patient by periodically depressing valve button.

Study Suggestions

1. Simulate and describe aloud the steps involved in using each piece of equipment covered in the lesson.

2. Describe under what conditions (medical or otherwise) you would use each piece of equipment covered in the lesson.

Lesson 7
Bleeding and Shock

Introduction

This lesson covers two additional life-threatening emergencies—bleeding and shock. Proper emergency care for these conditions can mean the difference between life and death for the patient.

Objectives

At the conclusion of Lesson #7, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- List 4 methods of controlling bleeding.
- Demonstrate control of external bleeding by use of direct pressure, elevation and pressure points.
- Describe when and how to use a tourniquet.
- List 4 signs of internal bleeding.
- List 6 types of shock.
- List 6 signs and/or symptoms of shock.
- Demonstrate and describe 5 steps in the treatment and prevention of shock.
- Perform a primary survey.
- Perform a secondary survey.
- Obtain and record a blood pressure by both auscultation and palpation.

Overview Of Lesson Contents

Mechanics Of Circulation

Review Of System Elements And Functions.

Heart. **Capillaries.**
Arteries. **Veins.**

Each time the heart pumps, a pulse can be felt throughout the arterial system. It can most easily be felt where a large artery is close to the skin surface, that is:

a. The radial pulse.
b. The carotid pulse.
c. The femoral pulse.
d. The brachial pulse (infants).

Blood is a red, sticky fluid that travels through the circulatory system. The average adult has six liters of blood.

Blood carries oxygen to body tissues and removes waste products.

It carries cells that combat infection in the body.

It has a capability of clotting; clotting normally takes 6 to 7 minutes.

The term perfusion means the circulation of blood within an organ. An organ is perfused if blood is entering it through the arteries and leaving through the veins.

Perfusion keeps the body cells healthy by providing them with oxygen and other nutrients and removing waste products.

Blood pressure is the pressure that the blood exerts against the walls of the arteries as it passes through them. This pressure causes the flow of blood.

The pressure wave has high and low points, called systolic pressure and diastolic pressure.

In normal males, systolic pressure varies from 100 mm Hg plus the age of the patient up to 140 mm Hg; diastolic pressure, from 65 to 90 mm Hg. In females, the pressure may be 8 to 10 mm Hg lower.

It is important for a physician to know the patient's blood pressure as soon as possible after an emergency event in order for him to evaluate the significance of any change in blood pressure measured at the hospital.

Blood pressure is measured with a sphygmomanometer. Procedures are:

Fasten cuff of sphygmomanometer about either arm above the elbow and inflate

with the rubber bulb until the mercury column or the needle of the dial stops moving with the pulse (usually between 150 and 200 mm Hg).

Ausculatory method.

Place the stethoscope diaphragm or bell over the brachial artery, earpieces should point forward.

Release air slowly from the bulb and observe the mercury column fall or aneroid dial return to zero.

Record as the systolic pressure the point on the gauge at which the sound of the pulse is first heard.

Record as the diastolic pressure the level on the gauge at which the sounds disappear.

Palpation method.

Release air slowly from the bulb and observe the mercury.

Record the systolic pressure when the pulse is first felt in brachial or radial artery.

Shock is the failure of the circulatory system to provide sufficient oxygenated red cells and perfuse cellular tissue.

Shock is caused by:

Failure of the heart to pump sufficient blood.

Severe blood or fluid loss so that there is insufficient blood for the heart to pump through the system.

Enlargement of blood vessels so that there is insufficient blood to fill them.

Breathing problems resulting in insufficient oxygen traveling through the system.

Types Of Shock

- **Hypovolemic Shock (Blood Loss)**
- **Respiratory Shock (Inadequate Breathing)**
- **Neurogenic Shock (Loss of Vascular Control By The Nervous System)**
- **Psychogenic Shock (Fainting)**
- **Cardiogenic Shock (Inadequate Functioning Of The Heart)**
- **Septic Shock (Severe Infection)**
- **Anaphylactic Shock (Allergic Reaction)**
- **Metabolic Shock (Bodily Loss Of Fluid)**

Signs And Symptoms Of Shock Include:

Restlessness and anxiety (these signs may precede all others).

Weak and rapid (thready) pulse.

Cold and clammy skin.

Diaphoresis.

Pale or mottled face.

Breathing shallow, labored, rapid, possible irregular or gasping.

Eyes dull or lusterless with dilated pupils.

Marked thirst.

Possible nausea or vomiting.

Gradual and steady drop in blood pressure.

Possible fainting in cases of rapidly developing transient shock.

Decreased capillary refill.

Signs And Symptoms Of Anaphylactic Shock

The skin may burn, flush, itch or break out. The face and tongue may swell. Cyanosis may be visible around the lips.

Breathing is difficult. There is a tightness or pain in the chest and persistent coughing.

Blood pressure drops and the pulse becomes weak or imperceptible.

Faintness and coma may ensue.

Emergency Care

Certain principles of initial treatment may be applied to all patients in shock:

Secure a clear airway and administer a high percent of oxygen.

Control bleeding.

Elevate lower extremities if injuries to them do not make this inadvisable.

Splint fractures.

Avoid rough handling.

Prevent LOSS of body heat.

Keep the patient supine unless he is personally more comfortable in another position.

Record blood pressure, pulse and other vital signs at 5-minute intervals.

Do not feed the patient or give him anything to drink.

Note: The basic care for shock is to care for the whole patient to **Prevent** shock.

Note: The only definitive treatment for anaphylactic shock is an injection to combat the agent causing the reaction. The patient may be stabilized with high percent of oxygen. The patient needs prompt transportation to a medical facility. The EMT may ASSIST an individual in administering medication (epinephrine) if allowed by State and local protocol.

External Bleeding

The loss of 1 liter of blood in an adult is serious and of 500 ml (½ liter) of blood in a child and 20% of blood volume in an infant is serious.

If uncontrolled, bleeding can result in shock and death.

Types

Bleeding from an artery spurts and is bright red in color because it is rich in oxygen.

Bleeding from a vein is steady and is dark bluish-red in color.

Blood oozes from a capillary and is similar in color to venous blood.

Procedures For The Control Of Bleeding

Direct Pressure

Direct pressure with the hand over the wound using a universal dressing or gauze pad will stop most bleeding.

The dressing should be held in place with a bandage.

If the bleeding does not stop, additional pressure should be applied with the hand.

Elevation may help control bleeding of an extremity.

Large wounds may require packing with gauze.

Pressure Points. If pressure dressings are not available, pressure points may be used to control severe bleeding in the arm or leg.

The brachial artery is pressed against the bone to stop bleeding below the pressure point.

The femoral artery is pressed against the pelvis to stop bleeding in the leg.

Tourniquet: A Tourniquet is used in a severe emergency when other means will not stop bleeding.

Tourniquets can damage nerves and blood vessels and result in the loss of an arm or leg.

Splints: When a fracture is present, much damage is caused to tissues by broken bones.

Pressure splints and pneumatic counter pressure devices can aid markedly in

controlling severe hemorrhage when massive lacerations of muscle and tissue and multiple fractures have occurred.

Pneumatic counter pressure devices can also aid in shock control.

Nosebleeds (epistaxis): can be serious enough to cause shock from blood loss.

Causes may include:

Fractured skull.

Facial injuries.

Sinusitis, infections, abnormalities of the inside of the nose.

High blood pressure.

Bleeding diseases.

Emergency Care procedures are:

Pinch the nostrils or place a bandage between the upper lip and the gum and press.

Keep patient in sitting position.

Keep patient quiet.

If available, apply ice over the nose.

Note: Bleeding from the nose or ears may mean there is a skull fracture. This type of bleeding should not be stopped.

Internal Bleeding

Internal bleeding can result in severe blood loss and the patient may die of shock.

A fractured shaft of the femur can result in an internal loss of 1 liter of blood.

Laceration of the liver can result in severe blood loss and be quickly fatal.

Signs

The signs of internal bleeding are those of hypovolemic shock.

In addition, the patient may cough up or vomit bright red blood, vomit dark blood (the color of coffee grounds), pass dark stools, pass bright red blood, or have a tender, rigid abdomen that enlarges.

The patient suffering from severe internal bleeding is a serious condition and the rescuer can do very little for him at the accident scene.

If bleeding is suspected in an extremity, it may be controlled by a pressure dressing or by application of a splint.

Fast but safe transportation to a hospital is a must.

High percent of oxygen should be administered.

Military Anti-Shock Trousers (MAST) or Pneumatic Counter Pressure Devices (PCPD) may be useful.

Review Of Primary Patient Survey

The procedures for the life-threatening survey are accomplished simultaneously, not sequentially. For example, the rescuer does not check for breathing first when he notices blood severely gushing from a wound. The EMT-A will feel, talk and observe.

Note: The EMT-A should always check for medical identification symbols.

Procedures:

Level of consciousness

Establish responsiveness

Determine orientation

Check pupils.

Respirations

Observe chest and feel for exhaled air at mouth and nose.

Assess rate, quantity, quality.

Don't forget the special case of the laryngectomee.

Pulse

Establish existence

Assess rate and quality

Bleeding/Shock

Observe for life-threatening external bleeding.

Observe for indications of internal bleeding.

Note: If there are multiple casualties, check each patient, stopping only to administer to those with life-threatening problems. The EMT-A should always check for medical identification symbols.

Study Suggestions

1. Simulate and describe aloud the steps involved in taking blood pressure. When a sphygmomanometer and stethoscope are available, take as many blood pressure measurements on your friends as you can.

2. Practice taking the pulse at the carotid, radial and femoral arteries. Practice on yourself and as many friends as you can.

3. The patient's upper leg is crushed and blood is spurting from the femoral artery. Describe what you might do for the patient and why.

4. The patient has sustained a severe blow to the head. He is barely conscious and is bleeding from the nose and ears. Describe how you would care for this patient and why.

5. The patient has several external bruises, has vomited dark red blood and appears to be going into shock. Describe what might be wrong with the patient and what you might do for him.

6. Perform as many examinations for life-threatening problems as you can. Use classmates or friends as "patients". As you perform the examinations, explain aloud what you are doing and implications of what you find. Simulate any actions you would take.

Lesson 8 Test and Evaluation: Airway Care, Pulmonary Arrest, Cardiac Arrest, Bleeding and Shock

Introduction

This lesson provides for interim evaluation student knowledge and skills. Each student completes a written examination designed to evaluate attainment of knowledge objectives specified for Lessons 1 through 7. Each student is evaluated on the skills taught in Lessons 1 through 7.

Objectives

At the conclusion of Lesson #8, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

—Pass a written test which evaluates knowledge objectives specified for Lesson 1 through 7.

—Pass a practical test to evaluate skill objectives with a minimum score of 70%.

Note: Objectives contained within 3, 4, and 5 may be minimized as they should have been previously evaluated, however, a review of select material is recommended.

Study Suggestions

1. Review all material contained within lessons 1 through 7.

Lesson 9 Review of Shock and Introduction to the Practical Application of Military Anti-Shock Trousers (MAST) or Pneumatic Counter Pressure Devices (PCPD)

Introduction

Uncontrolled shock can be fatal to the patient. The use of Pneumatic Counter Pressure Devices may prevent or correct cases of shock. This device can be dangerous and thorough training is therefore necessary.

Objectives

At the conclusion of Lesson #9, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

—The student will be able to list 6 signs/symptoms of shock.

—The student will be able to list the indications for Military Anti-Shock Trousers or Pneumatic Counter Pressure Device (PCPD) application inflation.

—The student will be able to list the contraindication(s) for Military Anti-Shock Trousers (MAST) or Pneumatic Counter Pressure Device (PCPD) application.

—Given the Pneumatic Counter Pressure Device, a patient or manikin in the supine position, and a fellow student as an assistant, the student will be able to demonstrate the procedure for the application and inflation of the MAST.

Overview Of Lesson Contents

Shock (Review)

Shock is a failure of the circulatory system to provide sufficient circulation to every body part. Cellular perfusion fails.

Shock is caused by:

Failure of the heart to pump sufficient blood.

Severe blood or fluid loss so that there is insufficient blood traveling through the system.

Enlargement of blood vessels so that there is insufficient blood to fill them.

Breathing problems resulting in insufficient oxygen traveling through the system.

Types of Shock

- **Hypovolemic Shock (Blood Loss)**
- **Respiratory Shock (Inadequate Breathing)**
- **Neurogenic Shock (Loss Of Vascular Control By The Nervous System)**
- **Psychogenic Shock (Fainting)**
- **Cardiogenic Shock (Inadequate Functioning Of The Heart)**
- **Septic Shock (Severe Infection)**
- **Anaphylactic Shock (Allergic Reaction)**
- **Metabolic Shock (Bodily Loss Of Fluid)**

Signs And Symptoms Of Shock

Restlessness and anxiety (these signs may precede all others).

Weak and rapid (thready) pulse.

Cold and clammy skin.

Profuse sweating.

Pale or cyanotic face.

Breathing shallow, labored, rapid, possibly irregular or gasping.

Eyes dull or lusterless with dilated pupils.

Marked thirst.

Possible nausea or vomiting.

Gradual and steady drop in blood pressure.

Possible fainting in cases of rapidly developing transient shock.

Signs And Symptoms Of Anaphylactic Shock

The skin may burn, flush, itch or break out. The face and tongue may swell.

Cyanosis may be visible around the lips.

Breathing is difficult. There is a tightness or pain in the chest and persistent coughing.

Blood pressure drops and the pulse becomes weak or imperceptible.

Faintness and coma may ensue.

Certain principles of initial treatment may be applied to all patients in shock.

Secure a clear airway and administer oxygen.

Control bleeding.

Elevate lower extremities if injuries to them do not make this inadvisable.

Splint fractures.

Avoid rough handling.

Prevent **LOSS** of body heat.

Keep the patient supine unless he is personally more comfortable in another position.

Record blood pressure, pulse and other vital signs at 5-minute intervals.

Do not feed the patient or give him anything to drink.

Note: The basic care for shock is to care for the whole patient to **Prevent** shock.

Note: The only effective treatment for anaphylactic shock is an injection to combat the agent causing the reaction. The patient needs prompt transportation to a medical facility. The EMT may **Assist** an individual in administering medication (epinephrine) if allowed by State and local protocol.

Military Anti-Shock Trousers (MAST) or Pneumatic Counter Pressure Devices (PCPD)

Pneumatic Counter Pressure Device Provides translocation of blood from the lower extremities and abdomen and increased peripheral resistance.

It also provides direct pressure for bleeding tamponade in lower extremities and abdomen and pelvis.

It stabilizes fractures of pelvis and lower extremities.

Indications for use

Blood pressure less than 90 mm Hg systolic with other clinical signs and symptoms of shock.

Open or closed abdominal injury with shock.

Pelvic fractures with shock.

Femur fractures with shock.

Multiple trauma patients with shock.

Shock in a pregnant female (legs inflated only).

CPR (follow local and State protocol).

Other cases when order by a physician.

Pneumatic Counter Pressure Devices **MUST NOT** be used in patients suffering from:

Pulmonary Edema.

Pulmonary edema is identified by:

a) Fluid in lungs.

b) Rales.

c) Distended neck veins.

d) Discussed in more detail in Lesson 19.

All Pneumatic Counter Pressure Device applications on patients with a medical etiology must be preceded by checking for Pulmonary Edema.

The inflation of the pneumatic counter pressure device on patients with Pulmonary

Edema may result in rapid deterioration and death of the patient and should not be undertaken by the EMT.

There may be other restrictions placed on the use of the Pneumatic Counter Pressure Device by local or State protocols; know and follow all restrictions.

Inflation Procedures

Place garment under patient by:

Sliding up from feet or,

Log rolling patient.

They may be placed on lifting apparatus prior to patient.

The top of garment at inferior margin of rib cage.

Enclose left leg and secure.

Enclose right leg and secure.

Enclose abdomen and secure.

Open stopcocks.

Inflate with foot pump.

Check and record blood pressure.

Stop inflation when:

Blood pressure reaches 100 mm/systolic.

Velcro "crackles"

Pop off valves release

Close stopcock and secure to prevent accidental deflation.

Do Not Deflate the Pneumatic Counter Pressure Device in the field unless ordered by and under the direct supervision of a physician knowledgeable in EMS.

It is a Dangerous procedure and requires that the blood pressure must be stabilized with I.V.'s first.

Deflation of the pneumatic counter pressure device may take extended periods of time.

Intravenous Fluid Resuscitation Is Not Considered To Be A Basic EMT Skill.

The EMT-A may be called upon to maintain an I.V. during a patient transfer, if allowed by protocol.

Study Suggestions

1. List the signs and symptoms of shock.
2. Practice taking blood pressures on a variety of individuals of differing height, weights and physical conditions.
3. List the signs and symptoms of Pulmonary Edema.

Lesson 10
Soft Tissue Injuries

Introduction

Soft-tissue injuries will be frequently observed in accident situations. Proper care of wounds can control bleeding, prevent infection, prevent shock and aid in patient comfort and well-being. This lesson covers emergency care for wounds and includes practice in dressing and bandaging.

Objectives

At the conclusion of Lesson #10, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- List the layers of skin
- List the 2 major functions of the skin.
- List 4 major structures within the skin and state the function of each.
- Describe 5 types of wounds and the emergency care of each.
- Describe how to care for a patient with an amputation and the care of the amputated part.
- Given a programmed patient, demonstrate proficiency in dressing and bandaging wounds of the following body parts:

—top of head	—neck
—forehead	—shoulder
—ear	—elbow/knee
—cheek	—arm/leg
—jaw	—hand/foot

- Given a programmed patient, demonstrates proficiency in applying a pressure dressing.
- Describe the care of wounds that would be considered unique to the pediatric patient.

Overview Of Lesson Contents

The Skin

The Functions Of The Skin Are:

Protection Of The Body and,

Regulation Of Body Temperature.

Layers Of The Skin Are:

Epidermis,

Dermis

Subcutaneous Tissue.

Closed Soft-Tissue Injuries

Closed injuries may range from damaged tissue beneath the skin to severe internal bleeding.

A contusion (or bruise) develops in the damaged tissue.

When much tissue is damaged, blood may pool in the damaged tissue and a hematoma may form.

Small bruises require no special care.

For severe injuries, bleeding should be controlled by counter-pressure.

If bleeding is associated with a fracture, splinting is indicated.

Open Soft Tissue Injuries

Types

Abrasion	Avulsion
Laceration	Puncture

Procedures for care are:

Control bleeding

Immobilize the part and keep the patient quiet.

Preserve avulsed parts.

Do not remove impaled objects.

Dressing And Bandaging

Functions to:

Stop bleeding,

Protect wound from further damage, and

Prevent further contamination and infection.

DRESSINGS are placed directly over the wound to control bleeding and prevent contamination.

A bandage holds a dressing in place. It should be tight enough to control bleeding but not so tight as to interfere with circulation.

To Apply A Pressure Dressing.

Cover wound with bulky sterile dressing,

Apply hand pressure over wound until bleeding stops,

Apply firm roller bandage, and

Check for bleeding and circulation.

Study Suggestions

1. Practice dressing and bandaging each of the body parts covered in this lesson. Use a classmate or friend as a "patient".
2. Tape a small stick to your leg and practice bandaging an impaled object.
3. Two of the patient's fingers have been severed—one is severed completely and one is hanging by a flap of skin. Describe how you would care for this patient.
4. The patient has suffered a severe blow to the arm and a large lump has developed. What has happened? How would you care for this patient?
5. You have dressed and bandaged a severe open wound of the leg. You suddenly notice that the bandage is soaked with blood. What would you do and why?
6. You are about to move an unconscious patient whose arm has been bandaged. The hand is white. What would you do and why?
7. Review the types of open wounds and be prepared to identify each from an illustration or simulation. Be prepared to describe or demonstrate how you would care for each wound type.

Lesson 11 Principles of Musculoskeletal Care and Fractures of the Upper Extremities

Introduction

Various types of fractures will be encountered in accident situations. Proper care of the fracture patient will improve his recovery time by preventing or minimizing the following complications: damage to muscles, nerves, blood vessels or skin tissue; restriction of blood flow; excessive bleeding; pain; and even paralysis. This lesson covers general concepts of fractures and dislocations and includes practice in immobilizing fractures of the upper extremity.

Objectives

At the conclusion of Lesson #11, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- List the bones in the upper extremity.
- List the bones in the lower extremity.
- List the vertebrae groupings of the spinal column.
- List the bones or bone groupings of the thoracic cage.
- List and define the two types of fractures.
- List five classifications of fractures.
- List 5 signs of fractures.
- List 3 signs of dislocations.
- List 3 signs of sprain.
- List distinctions in fractures and fracture care for pediatric patients.
- Describe the appearance of the extremity with each of the five classes of a fracture.

Overview Of Lesson Contents

The Muscular System

Muscle is a special form of tissue that contracts or shortens when stimulated and permits the body to move.

Types

Voluntary (Skeletal) Muscles. Actions are under conscious control.

Involuntary (Smooth) Muscles. Actions are not under conscious control.

Cardiac Muscle. The heart is a special kind of involuntary muscle with a very good blood supply and its own regulatory system.

The Skeletal System normally has 206 bones. It has the following functions.

It gives form to the body.

It supports the body and permits standing erect.

Muscles attached to the skeleton by ligaments permit motion at most places (joints) where bones join together.

It protects body organs.

The skull has two main divisions: the cranium and the face.

The Spinal Column, has 33 bones, called vertebrae, and 5 sections:

Cervical spine

Thoracic (Dorsal) spine

Lumbar spine

Sacral spine

Coccygeal spine

The thorax is made up of:

Twelve pairs of ribs.

Twelve thoracic vertebrae.

Sternum.

The upper extremities are designed as follows:

The upper extremities are attached to the shoulder girdle which is formed largely by the shoulder blade (scapula) and the collarbone (clavicle).

The arm (shoulder to elbow) has one bone known as the humerus.

The forearm (elbow to wrist) has two bones: the radius on the thumb side and the ulna on the little finger side.

The hand has many bones including those of the wrist and fingers.

The pelvis and lower extremities are designed as follows:

The pelvis is a bony ring formed by the sacrum and two pelvic bones.

The lower extremity is attached to the pelvis at the hip joint.

The upper leg (thigh) contains one bone known as the femur.

The lower leg has two bones; the tibia in front and fibula in back.

As with the hand, the foot has many bones.

The leg also has a bone at the kneecap known as the patella.

General Concepts Of Fractures And Dislocations

A **Fracture** means a break in a bone.

Basically, fractures are two types:

Open, in which the skin has been broken.

Closed, in which the skin has not been broken.

Note: Both open and closed fractures can result in serious blood loss. In addition open fractures have the danger of infection.

Fractures may also be classified by appearance:

Greenstick	Spiral
Transverse	Comminuted
Oblique	Impacted

Signs Of Fractures

Deformity. The arm or leg may be angled where there is no joint.

Tenderness. The point of the break may be tender or sore.

Crepitus. If the patient moves, there may be a grating sound or sensation where the broken ends of the bone rub together.

Swelling And Discoloration. May not be apparent for several hours.

Loss Of Use. The patient will not be able to move the limb or will do so with great pain.

Exposed Fragments. In open fractures, fragments of the bone may protrude through the skin.

A **Dislocation** is the displacement of the bone ends that form a joint.

Any joint may be dislocated; those frequently dislocated are the shoulder, elbow, fingers, hip and ankle.

Signs are similar to those for fractures, the most important being:

Deformity of the joint.

Pain or swelling.

Loss of movement.

A joint locked in a deformed position.

A **Sprain** is a partial tear or stretching of a ligament.

Signs are similar to those for fractures and dislocations except there are never protruding bone fragments and there is no deformity except swelling at a joint.

Differentiating Signs between fractures, dislocations and sprains. The following signs can be used to diagnose a fracture or dislocation.

Fracture—an angle in an arm or leg where there is no joint.

Fracture—an open wound with a bone or bone fragments protruding.

Dislocation—a deformity at a joint.

Note: If the above signs are not present but there is pain or tenderness or loss of movement of an extremity, it should be assumed that there is a fracture and the limb should be treated accordingly.

Review Of Patient Examination

As indicated previously, a patient survey is performed in two stages: an initial survey of life-threatening problems and a secondary survey of injuries not threatening to life.

In the secondary survey, the EMT makes a head-to-toe examination of the patient palpating and systematically observing for wounds and deformities. The EMT-A asks conscious patients if they feel pain or sensation. In unconscious patients, check for indications of pain, sensation.

The EMT-A should always observe the accident scene and check witnesses to attempt to determine any mechanism of injury.

The EMT-A should establish rapport with conscious patient—identifyng self, obtaining and using patient's name, explaining intended movements and procedures, reassuring patient.

Secondary Survey Procedures Are:

Head.

Observe for level of consciousness.

Check mouth for foreign objects, bleeding.

Check pupils.

Observe for wounds.

Feel gently for depressions in the skull.

Check ears and nose for fluid or blood.

Neck.

Observe for cuts, bruises, deformities.

Feel for areas of tenderness or deformities.

Upper Extremities.

Check for cuts, bruises, pain, deformities, unusual positions.

Check for sensation and circulation.

Ask patient if he can move arms, only if other procedures show no injury.

Chest.

Check for bruises, pain, deformities.

Check that both sides of the chest expand normally upon inspiration.

Back And Buttocks.

Check for cuts, bruises, pain or deformities.

Abdomen And Pelvis.

Check abdomen for tenderness or rigidity.

Compress pelvis gently.

Lower Extremities.

Check for cuts, bruises, pain, deformities, unusual positions.

Check for sensation and circulation.

Ask patient if he can move his legs, only if other procedures show no injury.

Medical History

Check for tags, bracelets, etc.

Vital signs.

Question patient.

General Principles Of Splinting

The primary objective for splinting is to prevent motion of bone fragments or dislocated joints.

Good emergency care can decrease hospital time and speed the patient's recovery by preventing or minimizing the following complications:

Damage to muscles, nerves or blood vessels caused by broken ends of bone.

Laceration of the skin—that is, a closed fracture becomes an open fracture.

Restriction of blood flow as a result of bone ends pressing against blood vessels.

Excessive bleeding due to tissue damage caused by bone ends.

Increased pain associated with movement of bone ends.

Paralysis of extremities due to fractured spine—discussed in a subsequent lesson.

General Rules Of Splinting

Remove or cut away clothing.

Cover all wounds with a sterile dressing.

Do not replace protruding bones.

Note and record circulation and neurological status distal to the injury before and after splinting.

Straighten deformities near joint with gentle steady traction unless pain is significant or resistance to correction is encountered.

Straighten an angulated fracture before splinting—use gentle traction.

Correct neck and spine deformities only if necessary to maintain an open airway.

Pad each splint carefully to prevent pressure and discomfort to the patient.

Immobilize the joint above and below the fracture or the bone above and below a dislocation.

Splint the patient BEFORE moving him.

When in doubt, splint.

Splinting The Upper Extremity

For Fractures Of The Clavicle—apply a sling and swathe.

For Fracture Of The Scapula—apply a sling and swathe.

For Dislocations Of The Acromioclavicular Joint—apply a sling and swathe.

For Anterior Dislocations Of The Shoulder Joint—Place pillow or rolled blanket between area and chest, apply sling and swathe.

For Fractures Of The Humerus, procedures are:

Proximal End—apply sling and swathe or bind arm to trunk.

Shaft—apply sling and swathe.

Distal End—apply sling and swathe or long-arm padded splint; check circulation.

For Dislocations Of The Elbow Joint—apply sling and swathe or long-arm padded splint; check circulation.

For Fractures Of The Proximal Ulna And Radius—apply an air splint, folded pillow, long-arm padded splint, or sling and swathe.

For Fractures Of The Forearm—apply an air splint or long-arm padded splint; apply sling.

For Fractures Of The Wrist—apply a bulky hand dressing and a padded board splint or air splint; apply sling.

For Dislocations Of The Wrist—straighten gently; apply a bulky hand dressing and an air splint or long-arm padded splint; apply sling.

For Fractures And Dislocations Of The Hand And Fingers—splint in position of function—place roll of gauze in palm; apply air or padded splint.

Study Suggestions

1. Practice immobilizing the following fractures and dislocations. Use a classmate or friend as a "patient". Where rigid splints are required, improvise if you do not have splints available. Be sure to pad all splints adequately.

- Fracture of the clavicle.
- Fracture of the humerus.
- Fracture of the elbow.
- Fracture of the forearm.
- Dislocation of the shoulder.
- Fracture of the hand.

2. Practice performing an examination for fractures, dislocations and sprains. Use a classmate or friend as a "patient". As you perform the examination, describe aloud what you are doing and why.

3. Review the types of fractures and be prepared to identify each from an illustration or simulation.

Lesson 12
Fractures of the Pelvis, Hip and Lower Extremities

Introduction

Fractures of the femur can result in severe blood loss. Fractures of the pelvis can result in injuries to internal organs with resultant blood loss and shock. Proper care of all fracture patients will improve their recovery time and minimize additional damage to injured tissues.

Objectives

At the conclusion of Lesson #12, the instructor will have provided sufficient information, demonstration and practice to the student, to ensure his/her ability to:

—Demonstrate correct application proficiency in the use of the following splints:

- —Sling and swathe
- —Wire ladder splint
- —Traction splint
- —Airsplint-arm/leg
- —Padded board
- —Pneumatic counter pressure device
- —Pillow splint
- —Improvised splint

—Demonstrate proper immobilization techniques for fractures/dislocations of:

- —clavicle
- —humerus
- —arm
- —pelvis
- —femur
- —leg
- —shoulder
- —elbow
- —wrist/hand
- —hip
- —knee
- —foot

Overview Of Lesson Contents

Fractures Of The Pelvis

When the pelvis is fractured the patient complains of pain. Pain is felt when sides of the pelvis are compressed.

The patient should be transported on a long spine board, scoop stretcher or pneumatic counter pressure device.

Shock may result and must be treated since blood loss can be severe. There may be injuries to organs of the genitourinary system.

The Hip

Dislocations Of The Hip.

Anterior Dislocation. The thigh is stretched out from the side of the body, lies flat and is externally rotated away from the body.

Posterior Dislocation. The knee is typically drawn up and the thigh is rotated inward toward to body. The patient may be unable to raise his toes or his foot if the sciatic nerve has been damaged.

Emergency Care Procedures. The dislocated limb should be supported by pillows or rolled blankets and long straps. The patient should be transported on a rigid stretcher.

Fractures Of The Hip.

The patient will usually lie with the foot turned outward. The leg may appear to be shortened although there is sometimes no deformity.

Shock may result since blood loss can be severe.

Emergency Care Procedures. Application of traction splint. Adequate immobilization can be obtained by placing pillows or folded blankets between the legs and tying the legs together.

Pneumatic Counter Pressure Device. May be useful in the splinting of hip fractures.

Fractures Of The Shaft Of The Femur.

There is often marked deformity. The leg below the fracture will be severely angulated or rotated. Fractures are often open.

Shock may develop as there will be a large blood loss whether the fracture is open or closed. Circulation in the foot may be impaired.

Emergency Care Procedures. The leg should be gently straightened and immobilized with a traction splint.

Injuries About The Knee.

With a sprain swelling, tenderness and loss of function may be apparent. The leg should be gently straightened and a long-leg rigid splint applied. All suspected sprains should be splinted with a long-leg rigid splint or air splint.

With A Dislocation. Deformity is grotesque. Circulation in the foot may be impaired. The deformity should be straightened. The leg should be immobilized with a traction splint (no traction), a rigid long-leg splint, an air splint, or pillow or blanket splint.

The EMT should never force a deformity straight and should never straighten a deformity if it causes increased pain to the patient.

With Fractures. There is usually much pain and swelling and there may be significant deformity. Circulation in the foot may be impaired. The deformity should be gently straightened, and a splint applied as for dislocations.

In Dislocation Of The Patella the knee is usually flexed and the patella is displaced laterally. The leg should be gently straightened. The leg should be immobilized in a long-leg splint or air splint.

Fractures Of The Tibia Or Fibula Shaft.

The leg may be severely deformed. Fractures of the tibia are frequently open. Circulation in the foot may be impaired. The deformity should be gently straightened. A traction splint, long-leg rigid splint or air splint may be applied.

Injuries About The Ankle.

There may be severe deformity. It will probably not be possible to differentiate between a dislocation and a fracture. Deformities should be gently straightened. A long- or short-leg rigid splint, air splint or pillow splint should be applied.

Fractures Of The Foot.

There is usually pain and swelling. A spine injury should be suspected if heel pain is associated with back pain, or a fall from heights. The foot should be immobilized in a rigid short-leg splint, air splint or pillow splint.

Study Suggestions

1. Working with a classmate, or alone, as appropriate, practice immobilizing the following fractures and dislocations. Use a classmate or friend as a "patient". When rigid splints are required, improvise if you do not have splints available. Be sure to pad all splints adequately.

Fracture of the hip.	Fracture of the tibia.
Fracture of the femur.	Fracture of the ankle.
Dislocation of the knee.	

2. Review the signs of fractures and dislocations of the pelvis, hip and lower extremity and be prepared to identify each from an illustration or simulation.

Lesson 13
Practical Lab: Fracture Care of the Upper and Lower Extremities

Introduction

This lesson is designed to provide you with the opportunity to attain proficiency on all practical skills covered in the two previous lessons. Proper care of fractures will reduce pain and suffering of patients and prevent further injury.

Objectives

At the conclusion of Lesson #13, the instructor will have provided sufficient information, demonstration and practice to the student, to ensure his/her ability to:

- Demonstrate the correct application of the following splints:
  - —Sling and swathe
  - —Wire ladder splint
  - —Traction splint
  - —Airsplint—arm/leg
  - —Padded board
  - —Pneumatic Counter Pressure Device
  - —Pillow splint
  - —Improvised splint
- Demonstrate proper immobilization techniques for fractures/dislocations of:
  - —Clavicle
  - —Humerus
  - —Arm
  - —Pelvis
  - —Femur
  - —Leg
  - —Shoulder
  - —Elbow
  - —Wrist/hand
  - —Hip
  - —Knee
  - —Foot

Study Suggestions

1. Working with classmates, practice the use of:
   - Sling and swathe.
   - Wire ladder splint.
   - Traction splint.
   - Air splint—Arm/leg.
   - Padded board splint.
   - Pneumatic Counter Pressure Device.
   - Pillow splint.
   - Cardboard splint.
2. Complete a primary and secondary survey on a simulated patient and identify simulated fractures.
3. List the signs and symptoms of fractures, dislocations and sprains.

Lesson 14
Injuries of the Head, Face, Eye, Neck and Spine

Introduction

Head injuries can result in brain damage, spine injuries in paralysis, and face and neck injuries in severe airway difficulties. It is especially important that the rescuer be knowledgeable about the signs, seriousness and management of these patients. The lesson includes student practice in immobilizing patients with suspected spine injuries on both short and long backboards.

Objectives

At the conclusion of Lesson #14, the instructor will have provided sufficient information, demonstration and practice to the student, to ensure his/her ability to:

- Describe how brain is protected from injury.
- List functions of central nervous system.
- List functions of peripheral nervous system.
- List functions of autonomic nervous system.
- State function of cerebrospinal fluid.
- List 4 types of brain injury and how they occur.
- List 3 types of intracranial hematoma and how they occur.
- List 5 signs/symptoms of possible brain injury.
- List 3 signs/symptoms of possible skull fracture.
- Describe treatment for blood and/or cerebrospinal fluid loss of nose/ears.
- List steps in emergency care for patient with suspected skull fracture.
- Describe treatment for suspected brain injury.
- List steps in emergency care for soft tissue neck/facial injury.
- List 6 signs/symptoms of suspected neck/spine injury.
- Demonstrate how to open airway in patient with suspected neck injury.
- Demonstrate how to evaluate conscious patient with suspected spinal injury.
- Demonstrate how to evaluate unconscious patient with suspected spinal injury.
- List 3 situations when a spinal injury should be suspected.
- Demonstrate proper cervical traction.
- Demonstrate proper application of 3 (1 improvised) cervical immobilization devices.
- Demonstrate proper short spine board immobilization technique.
- List steps in proper spinal cord injury management.
- Demonstrate 4 person lift for patient with suspected spinal injury.
- Demonstrate 4 person log roll for patient with suspected spinal injury.
- Demonstrate proper application of long spine board.
- Demonstrate how to "package" a patient with a suspected spinal injury to ensure no movement with board turned/tipped.
- Demonstrate proper helmet removal techniques.
- List three instances when a short spine board should be used.
- List 7 anatomical structures of the eye and describe the function of each.
- List the possible normal/abnormal pupil reactions/size.
- Describe the treatment for chemical burns of the eye.
- Describe the treatment for thermal burns of the eye (lid).
- Describe the treatment for light burns of the eye.
- Demonstrate the proper bandaging technique for an eye with an impaled object.
- Describe treatment for a lacerated eyelid or eyeball.
- Describe special considerations for patients with contact lenses.

Overview Of Lesson Contents

The Nervous System consists of the brain, spinal cord, and nerves.

The Brain is the controlling organ of the body and the center of consciousness. It occupies the entire space within the cranium. Each type of brain cell has a specific

function and certain parts of the brain perform certain functions.

The Spinal Cord consists of long tracts of nerves that join the brain with all body organs and parts and is protected by the spinal column.

Sensory nerves send information to the brain on what the different parts of the body are doing relative to their surroundings.

Motor nerves emanate from the brain and result in stimulation of a muscle or organ.

Injuries To The Spine

It is especially important to provide proper care for patients with suspected spinal injuries since damage to the spinal cord can result in paralysis or death.

All unconscious accident patients should be treated as if they had spinal injuries and all conscious patients should be carefully checked for spine injuries prior to movement.

Accident patients with weakness or numbness of arms or legs must be assumed to have spine injuries.

The following signs may be indicative of spinal cord injury:

Pain. The patient may be aware of pain in the area of injury.

Tenderness. Gently touching the suspected area may result in increased pain.

Painful Movement. If the patient tries to move, the pain may increase—never try to move the injured area or the patient.

Deformity. Deformity is rare although there may be an abnormal bend or bony prominence.

Cuts And Bruises. Patients with neck fractures will have cuts and bruises on the head or face. Patients with injuries in other spine areas will have bruises on the shoulders, back or abdomen.

Paralysis. If the patient is unable to move or feels no sensation in some part of his body, he may have a spinal fracture.

Steps For Checking Signs And Symptoms

In Conscious Patients Procedures Are:

Ask—what happened, where does it hurt, can you move your hands or feet, can you feel me touching your hands (feet)?

Look—for bruises, cuts, deformities.

Feel—for areas of tenderness, deformities.

Have Patient Move—if he can do so comfortably.

In Unconscious Patients Procedures Are:

Look—for cuts, bruises, deformities.

Feel—for deformities.

Ask Others—what happened?

Complications Of Spine Injury

Persons with neck injuries may have paralyzed chest muscles. Breathing can then be accomplished only by the diaphragm. Inadequate breathing and shock may result.

Paralysis of the nerves affecting the size of blood vessels may occur and shock may result.

Emergency Care Procedures For Spine Injury

In addition to caring for life-threatening problems, the most important consideration for a victim with a suspected spine injury is to immobilize him BEFORE moving.

Unless it is necessary to change a patient's position to maintain an open airway or there is some other compelling reason, it is best to splint the neck or back in the original position of deformity.

Patients with suspected spine injuries will require immobilization on a spine board or other device.

A helmet should be removed unless there is difficulty in removing it, or increased pain. In such instances, the patient should be immobilized on the spine board with the helmet in place.

Injuries To The Skull And Brain.

Fractures of the skull are common in accident victims. Their seriousness depends on the amount of injury to the brain. Serious brain injury is much more common when there is not skull fracture.

Skull fractures may be open or closed. They may also be:

- **Linear**
- **Comminuted**
- **Depressed**
- **Penetrated Skull**
- **Or Basal**

The brain and spinal cord are protected by layers of tissue filled with a liquid called cerebrospinal fluid which may drain from the ears or nose in the event of skull fractures. Do NOT attempt to stop bleeding from the nose or ears when a skull fracture is suspected.

Signs of a skull fracture include:

Deformity of the skull.

Blood or clear fluid (cerebrospinal fluid) draining from ears or nose.

Black eyes.

A **Concussion** is a temporary loss of function for some or all of the brain; signs are:

Patient may be confused or staggering or become totally unconcious.

Patient may have some loss of memory for events surrounding the accident.

A **Contusion** is bleeding and abnormal swelling of brain tissue; signs are:

Patient may lose consciousness.

Paralysis may be present.

One pupil may dilate.

Vital signs may progressively deteriorate.

A **Cerebral Hematoma** is caused by blood clots causing pressure on brain tissues. Signs are the same as those for contusions.

Care for patients with suspected head injuries require management of the injury as well as repeated evaluation over time. Procedures are:

Correct life-threatening problems—maintain respiration and circulation.

Suspect a cervical or other spine injury in vehicular accidents and falls.

Control bleeding—not drainage.

Dress and bandage open wounds—minimize pressure.

Position according to associated injuries:

Protect patient from hurting himself if he convulses.

Monitoring The Unconscious Patient

Unconscious patients need special management and constant evaluation from contact to delivery at the medical facility.

First and foremost is airway support. The semi-prone position should improve breathing.

Serious Bleeding Must Be Controlled.

Cervical Spine Injury must be assumed and immobilizations must be completed for any unconscious trauma patients.

Accurate recording of vital signs including level of consciousness is necessary to provide baseline data.

Injuries To The Face And Neck

The face and scalp are richly supplied with arteries and veins and wounds of these areas bleed heavily.

Control by direct pressure. For cheek wounds, it may be necessary to hold a gauze pad inside the cheek as well as outside.

Suspect brain or neck injuries for any wounds of the head.

Check the mouth carefully for any loose objects, such as broken teeth that might impair the airway.

Check carefully for bleeding into the mouth or throat that might impair the airway.

Cover exposed nerves, tendons, or blood vessels with a moist bandage.

The main danger of facial features lies in airway problems. Bone fragments and blood may obstruct the airway—check the airway carefully.

Emergency care is the same as for soft tissue injuries, that is, maintain the airway, control bleeding, and dress and bandage open wounds.

Emergency Care For Neck Wounds

Control arterial bleeding by direct pressure.

If a large vein is torn, apply pressure above and below the point of bleeding to prevent air from entering the circulatory system—the latter could be rapidly fatal.

Always suspect a cervical spine fracture.

For laryngeal and tracheal injury, the patient should be kept calm and breathing slowly. Oxygen should be administered. If breathing becomes increasingly more difficult, transport immediately as advanced airway care will be necessary.

Helmet Removal

May be necessary to properly immobilize or maintain airway; procedures are:

Remove with caution.

One EMT-A maintains in-line traction from below.

The straps are loosened.

A second EMT-A assumes traction.

The first EMT-A removes helmet, spreading at the ears.

The first EMT-A replaces traction with more stable and conventional methods.

The Eye is a globe.

Parts of the eye include:

Vitreous humor.	Sclera.
Iris.	Conjunctiva.
Pupil.	Eyelids.
Cornea.	Tear glands.

The Pupils Of The Eye Are Considered To Be A Vital Sign. Pupils can be:

Dilated.	Unequal
Constricted.	Fixed.

Signs of injuries to the eye include:

Swollen or lacerated eyelids.

Bloodshot eyes.

Scratched cornea.

Small foreign bodies can be removed by a cotton-tipped applicator. Small bodies on the cornea should not be removed.

Impaled objects are not removed. The eye should be covered with a papercup/cone or eye shield and bandaged. Both eyes should be covered to minimize movement.

Chemical Burns of the eye are serious; they should be copiously flushed with water before bandaging.

In the case of **Burned Eyelids,** the eye should be covered with a sterile moist dressing.

For **Lacerations And Contusions**—pressure may be applied to control bleeding; do not apply pressure to the eyeball itself.

For an **Extruded Eyeball,** the eye should be gently covered with a moist dressing; do **Not** replace eyeball.

Study Suggestions

1. Practice immobilizing the neck with a cervical collar or blanket. Use a classmate or friend as a "patient".
2. Practice examining a conscious patient for spine injury. Use a classmate or friend as a "patient".
3. Describe how you would examine an unconscious patient for spine injury.
4. An unconscious patient is slumped over the steering wheel. He has multiple bruises about the face and blood is draining from his nose. Discuss what might be wrong with the patient, how you would examine him, and how you would care for him.
5. The unconscious motorcycle rider is lying on his back in the road. You have examined him, and in addition to a closed fracture of the fibula, he appears to have a cervical fracture. Describe how you would care for the patient.
6. In examining an unconscious victim with severe facial injuries, you note that the pupil of one eye is dilated. What might you suspect?
7. The unconscious patient has a fractured jaw. What would you check for and why?
8. Complete a neural watch chart on a simulated patient. Be prepared to discuss your patient and what the findings on the chart suggest.
9. The patient has multiple bruises about the face and neck, is having severe breathing difficulties and is unable to speak. What might you suspect is wrong with the patient and what would you do to care for him?
10. Practice dressing and bandaging an eye with an extruded eyeball. Use a classmate or friend as a "patient".
11. Practice removing a helmet without moving the cervical spine.

Lesson 15 Practical Lab: Patient Assessment and Spine Immobilization

Introduction

Proficiency at spine immobilization is critical to prevent paralysis or death in victims of trauma. The skills required are difficult and must be practiced frequently.

Objectives

At the conclusion of Lesson #15, the instructor will have provided sufficient information, demonstration and practice to the student, to ensure his/her ability to:

- Demonstrate primary/secondary survey in both conscious and unconscious patient (to include neurocheck).
- Demonstrate how to open airway in patient with suspected neck injury.
- Demonstrate how to evaluate the neurological status of a conscious patient with a suspected spinal injury.
- Demonstrate how to evaluate the neurological status of an unconscious patient with suspected spinal injury.
- Demonstrate manual cervical traction.
- Demonstrate the application of 3 (1 improvised) cervical immobilization devices.
- Demonstrate short spine board immobilization techniques.
- List steps in spinal cord injury management.
- Demonstrate 4 person lift for patient with suspected spinal injury.
- Demonstrate 4 person log roll for patient with suspected spinal injury.
- Demonstrate the application of a long spine board.
- Demonstrate how to "package" a patient with a suspected spinal injury to ensure no movement when turned/tipped.
- Demonstrate helmet removal techniques.
- Demonstrate proper application techniques of spinal immobilization including: immobilization with chin strap, immobilization of joint above and below fracture and immobilization of body prior to head and neck.

Study Suggestions

1. Working with classmates, practice:
   Manual cervical traction.
   The application of cervical immobilization devices, including: Short spine board immobilization techniques. 4 person log roll for patient with suspected spine injury. The application of a long spine board. Packaging a patient so board can be turned onto side. Helmet removal techniques.
2. Complete a primary and secondary survey on one or more simulated patients and:
   Demonstrate opening an airway when neck injuries are suspected.
   Evaluate neurological status of a conscious and unconscious patient with suspected spinal injury.

Lesson 16
Injuries to the Chest, Abdomen and Genitalia

Introduction

Injuries to the chest and abdomen can be life-threatening if internal organs are injured. Recognizing the potential seriousness of these injuries and providing appropriate care can make the patient more comfortable, minimize the extent of damage, and possibly save his life. In addition to knowledge of causes, signs, dangers and techniques of care for injuries to these body parts, the lesson includes practice in dressing and bandaging chest wounds as well as practice in performing a complete patient examination.

Objectives

At the conclusion of Lesson #16, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- List the boundaries of the (thoracic) chest cavity.
- List the contents of the chest (thoracic) cavity.
- List the 2 classifications of chest injuries.
- List 4 signs/symptoms and describe emergency treatment for:
  - —pneumothorax
  - —hemothorax
  - —tension pneumothorax
  - —pericardial tamponade
  - —flail chest
  - —subcutaneous emphysema
  - —open pneumothorax (sucking chest wounds)
  - —traumatic asphyxia
- List the boundaries of the abdominal cavity.
- List the contents of the abdominal cavity.
- Describe complications/implications arising from injury to each abdominal organ.
- List 10 possible signs/symptoms of abdominal injury.
- Demonstrate assessment of patient with abdominal injury.
- Describe care of patient with abdominal evisceration.
- Describe care of patient with impaled object in abdomen.
- Describe care of patient with blunt abdominal injury.
- List the components of the external male genitalia.
- List the components of the external female genitalia.
- Describe emergency care of injuries to external male genitalia.
- Describe emergency care of injuries to external female genitalia.
- List local procedures for dealing with sexual assault victims.

Overview Of Lesson Contents

The Chest

The rib cage includes the ribs, the thoracic vertebrae, and the sternum.

The ribs are connected to the vertebrae in back and all but two are connected to the sternum in front by cartilage.

The rib cage encloses the lungs and heart, and damage to the ribs can result in damage to these organs.

Injuries

Signs of chest injuries:

Pain at the site of injury.

Pain with breathing.

Dyspnea.

Failure of one or both sides of chest to expand normally with inspiration.

Coughing up blood.

Rapid weak pulse and low blood pressure.

Cyanosis.

General Principles Of Care include control of bleeding and maintaining breathing and adequate oxygenation.

Types Of Injuries. Injuries to the chest include rib fractures, penetrating injuries, and injuries to the internal chest organs (heart and lungs). All, of course, may occur together.

Rib Fractures

A common finding of rib fracture is localized pain.

Simple fractures should not be bound, strapped or taped, although:

With multiple fractures, the patient may be more comfortable with the arm strapped to the chest with a swathe.

A **Flail Chest** occurs when each of three or more ribs is broken in two places, the resultant portion will not move with the rest of the rib cage when the patient attempts to breathe. Immobilizing the ribs may improve respirations.

Penetrating Wounds consist of open chest wounds in which the chest wall is torn—typically by a foreign object.

The wound must be closed quickly since it can result in air outside the lung in the chest cavity.

Compression Injuries can increase intrathoracic pressure, cause rib fractures, a flail chest, and traumatic asphyxia.

Chest injuries may result in the following conditions:

Pneumothorax—air enters the chest cavity through a sucking wound or leaks from a lacerated lung. The lung cannot expand.

Spontaneous Pneumothorax—air leaks into the chest from a congenitally weak area in the lung surface and the lung collapses.

Tension Pneumothorax—air continuously leaks out and the lung collapses completely. Pressure rises and the collapsed lung is forced against the heart and other lung. Release of a bandage on a chest wound may be effective in releasing tension.

Hemothorax—blood leaks into the chest cavity from lacerated vessels or the lung itself and the lung compresses.

Open Pneumothorax—air enters the chest cavity through an open wound. The wound must be closed immediately with an air-tight dressing. Aluminim foil, plastic wrap or any dressing may be used.

Subcutaneous Emphysema—a fractured rib has pierced a lung. A crackling sensation is felt under the fingertips as one feels over the area of the fracture.

Traumatic Asphyxia—severe compression puts pressure on heart and forces blood back into veins of the neck. It may also cause severe lung damage. This is a severe emergency.

Pericardial Tamponade—blood or other fluid in the pericardial sac outside the heart exerts pressure on the heart.

Lacerations Of The Great Vessels—a major blood vessel is torn.

Traumatic Emphysema—a sudden compression injury occurs when the glottis is closed; air sacs are ruptured and leak air.

The Abdomen And Genitalia

The Contents Of The Abdominal Cavity Include: major organs of digestion, excretion, female reproduction.

The **Digestive System** is composed of the following parts:

Mouth	Gallbladder and bile ducts	Pancreas
Salivary glands	Small intestine	Liver
Pharynx	Large intestine	Spleen
Esophagus	Appendix	
Stomach	Rectum and anus	

The Urinary System Consists Of The Following:

Kidneys

Ureter

Urinary bladder and urethra

The Male Reproductive organs are:

Testicles.	Prostate gland.
Vasa deferentia.	Urethra
Seminal vesicles	Penis

The Reproductive organs of the Female are:

Ovaries	Uterus
Fallopian tubes	Vagina

Injuries To The Abdomen may be open or closed.

The abdomen contains both hollow and solid organs and may result in peritonitis or serious bleeding.

The Signs of abdominal injury include:

Patient will be still, usually with legs drawn up.

Breathing will be rapid and shallow.

Skin wounds and penetrations may be evident.

Pulse may be rapid and blood pressure low.

Patient may be nauseated and may vomit.

Organs may protrude.

Fractures may be evident.

There may be blood in the urine.

Emergency Care For Abdominal Injuries

Suspect shock and work to prevent it, Pneumatic Counter Pressure Devices may be required.

Constantly monitor and evaluate vital signs.

Be alert for vomitus.

Do not remove impaled objects.

Do not touch protruding organs. Cover them with a sterile dressing and keep the dressing moist or apply an occlusive dressing.

Injuries To External Male Genitalia may be bruises, lacerations, penetrating objects and avulsions.

Emergency care rules are essentially the same as those for all other bodily injuries.

Injuries To Internal Female Genitalia are rarely seen except in the pregnant female. Blunt injuries may rupture the uterus, cause loss of life of the fetus and severe hemorrhage.

Injuries To External Female Genitalia. The types and care for these injuries are similar to those of injuries to other body parts and emergency care is the same. Nothing should be placed in the vagina.

Study Suggestions

1. Practice dressing and bandaging a sucking chest wound. Use a classmate or friend as a "patient".
2. The patient has a knife in his chest. Describe how you would manage this patient and what you would watch for. Describe ALL POSSIBLE complications.
3. You suspect the patient has internal abdominal injuries. Describe the patient and what made you come to this conclusion.
4. As you approach the scene, you see a rescuer attempting to replace a patient's protruding intestine. What would you do and why?
5. Review the procedures for the application of Pneumatic Counter Pressure Devices.

Lesson 17
Practical Lab: Injuries

Introduction

Techniques of wound care require practice to gain proficiency. Likewise continuous review and practice of principles of spine immobilization is necessary to retain skill levels. Fracture care may reduce suffering and prevent additional damage. One or more of these skills are used on almost every trauma patient.

Objectives

At the conclusion of Lesson #17, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to any or all of the following:

- Demonstrate the bandaging technique for an eye with an impaled object.
- Demonstrate bandaging techniques for scalp lacerations on top/side of head.
- Demonstrate how to open airway in patient with suspected neck injury.
- Demonstrate how to evaluate conscious patient with suspected spinal injury.
- Demonstrate proper cervical traction.
- Demonstrate proper application of 3 (1 improvised) cervical immobilization devices.
- Demonstrate proper short spine board immobilization technique.
- List steps in proper spinal cord injury management.
- Demonstrate 4 person lift for patient with suspected spinal injury.
- Demonstrate 4 person log roll for patient with suspected spinal injury.
- Demonstrate proper application of long spine board.
- Demonstrate how to "package" a patient with a suspected spinal injury to ensure no movement when turned/tipped.
- Demonstrate proper helmet removal techniques.
- Demonstrate primary/secondary survey in both conscious and unconscious patients.
- Demonstrate proper application of Military Anti-Shock Trousers (MAST) or pneumatic counter pressure device. (PCPD).
- Demonstrate application proficiency in use of the following splints:
  - —Sling and swathe
  - —Wire ladder splint
  - —Traction splint
  - —Air splint arm/leg
  - —Padded board-pneumatic counter pressure device
  - —Pillow splint
  - —Improvised splint
- Demonstrate bandaging techniques for chest wounds.
- Demonstrate bandaging techniques of abdominal eviscerations.
- Demonstrate immobilization techniques for fractures/dislocations of:
  - —Clavicle
  - —Shoulder
  - —Humerus
  - —Elbow
  - —Arm
  - —Wrist/hand
  - —Pelvis
  - —Hip
  - —Femur
  - —Knee
  - —Leg
  - —Foot

Study Suggestions

1. Working with classmates, complete a primary and secondary survey, identifying and treating all injuries.
2. Review procedures for splinting upper and lower extremities.
3. With classmates, practice splinting a variety of immobilization procedures for fractures of the upper extremities, lower extremities and spinal column.

Lesson 18
Test and Evaluation: Injuries

Introduction

This lesson provides for interim evaluation of student knowledge and skills. Each student completes a written examination designed to evaluate attainment of knowledge objectives specified for Lessons 9 through 17. Each student performs each skill taught in Lessons 9 through 17 for an instructor and is evaluated on his performance.

Objectives

At the conclusion of Lesson #18, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- Demonstrate mastery of knowledge objectives in Lessons 9, 10, 11, 12, 14 and 16 by achieving a score of 70% or higher on written test.
- Demonstrate knowledge of practical skills by performing selected representative skill objectives in Lessons 9, 10, 11, 12, 14 and 16.

Note: Lessons 13, 15 and 17 are not included as they are practice sessions where objectives are restated from previous lessons.

Study Suggestions

1. Review all material contained in Lessons 9 through 17.

Lesson 19
Medical Emergencies I

Introduction

This lesson covers common medical emergencies including ingested and inhaled poisons, bites and stings, heart attack, stroke and dyspnea. Severe cases can be life-threatening. The EMT-A should be able to recognize these conditions and render approprite emergency care. The lesson also includes a review of results of the written and practical examinations administered in the previous two lessons and provides an opportunity for students to practice as needed the skill of cardiopulmonary resuscitation and use of mechanical aids to airway care and resuscitation.

Objectives

At the conclusion of Lesson #19, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- Define poison.
- List 4 ways for poison to enter body and give 2 examples of each.
- State how to contact nearest poison control center.
- List 7 signs/symptoms of poisoning.
- List the immediate steps in emergency care of poisoned patient.
- List 3 circumstances when vomiting should NOT be induced in patients suffering from ingested poison.
- State how to induce vomiting in adult patient.
- State how to induce vomiting in a child.
- State emergency care of unconscious victim of poisoning.
- List emergency care for victims of inhaled poison.
- List emergency care for victims of injected poison.
- List emergency care for victims of absorbed poison.
- List 5 signs/symptoms of patient suffering allergic reaction to an insect sting.
- State emergency care for same patient suffering allergic reaction to an insect sting.
- State physical characteristics of a pit viper and a coral snake.
- List 4 signs/symptoms of patient bitten by pit viper.
- List 4 signs/symptoms of patient bitten by coral snake.
- List emergency care for snake bites.
- List 3 examples of stinging marine animals.
- Describe emergency care for marine animal stings.
- List 3 examples of marine animals that can cause puncture wounds.
- Describe emergency care for puncture wounds from marine animals.
- Define atherosclerosis.
- Define Myocardial Infarction.
- List 4 risk factors associated with heart disease.
- List 3 causes of heart attack.
- Define angina pectoris.
- List signs/symptoms of angina.
- List signs/symptoms of heart attack.
- List the emergency care/treatment for angina.
- List the emergency care/treatment for MI.
- Define chronic congestive heart failure.
- List signs/symptoms of congestive heart failure.
- State the emergency care for congestive heart failure.
- Define stroke.
- List 3 causes of stroke.
- List 7 signs/symptoms of stroke.

- Describe steps in treatment of stroke patients.
- List special considerations for treatment of stroke/patients.
- Define dyspnea.
- Define pulmonary edema.
- Define chronic obstructive pulmonary disease.
- List 3 non-traumatic causes of dyspnea.
- List signs/symptoms of pulmonary edema.
- List signs/symptoms of COPD.
- Define hyperventilation.
- List signs/symptoms of hyperventilation.
- List steps of treatment of hyperventilation.
- Provide practice for objectives for lessons in CPR and mechanical aids to resuscitation.

Overview Of Lesson Contents

Ingested Poisons

Signs are variable depending on the substances. There may be burns, odors or stains about the mouth. Other common signs include:

Nausea/vomiting.	Excessive salivation or sweating.
Abdominal pain.	Abnormal respiration.
Diarrhea.	Unconsciousness.
Dilation or constriction of pupils.	Convulsions.

Emergency Care includes diluting the substance, inducing vomiting and contacting the Poison Control Center.

Dilution is accomplished with milk or water.

Vomiting should **Not** be induced when:

Strong acids or alkalis are swallowed

Petroleum products are swallowed

Patient is not fully conscious or is convulsing

Vomiting is typically induced with syrup of ipecac.

Activated charcoal may be a helpful absorbent after emesis.

Soothing agents help to decrease gastrointestinal irritation.

The poisonous substance should be located, if possible, and the Poison Control Center contacted to determine the most effective procedure.

Poisonous plants can cause severe reactions ranging from gastrointestinal disturbances to nervous system disorders and circulatory collapse. There are no antidotes for plant poisons. Severe cases need basic life support and speedy transport.

Inhaled Poisons

For inhaled poisons; such as carbon monoxide, the major concern is removing the patient from the source.

Oxygen and cardiopulmonary resuscitation should be administered as required.

The Poison Control Center should be contacted.

Bites And Stings

Bees, Wasps, Ants. The major danger arises when the person has a hypersensitive reaction.

These reactions were discussed previously under the heading "anaphylactic shock".

In addition to basic life support, the following should be done:

Place a constricting band above an injury in an extremity.

If present, carefully scrape stinger and venom sac away.

Place an ice pack over the bitten area.

May ASSIST patient with medication if allowed by State and local protocol.

Spiders

Death has rarely been reported.

Severe cases should receive basic life support, application of a cold pack to the bite and immediate transport.

Antivenins are available for black widow and brown recluse spider bites, and identification of the insect is important.

Snakes

Venomous species include the pit viper (rattlesnake, cottonmouth and copperhead) and coral snake. Coral snake is especially dangerous since it afects the central nervous system.

Emergency care for pit vipers bites:

Calm patient.

Cleanse wound.

Wrap soft rubber tubing about the extremity above and below fang marks to occlude ONLY superficial venous flow.

Splint the extremity.

Check vital signs.

Prevent shock.

Apply ice pack to the wound only if directed to do so directly by a physician or Poison Control Center.

Incise wound and suction with a suction cup only IF wound occurred within previous 30 minutes, IF patient shows signs of envenomation, and IF directed to do so by a physician or Poison Control Center.

Emergency care for coral snake is identical except that the constricting band is placed above the wound only and incisions and suction are not recommended.

Heart Attack

The heart is a muscle and, like all muscles in the body, is supplied with arteries.

Arteriosclerosis is a disease process that can damage coronary arteries. It lays down deposits of fat which progressively narrow the artery.

When an artery becomes blocked, that part of the muscle which it serves dies and the patient has what is known as a myocardial infarction.

The heart will still continue to pump even though part of the muscle dies. However, the attack usually occurs in the left ventricle which may be unable to pump all blood coming from the lungs. Fluid may accumulate in the lungs—a condition known as pulmonary edema.

If too much muscle is lost, shock and sudden death will result.

An acute myocardial infarction may have the following signs/symptoms:

Sudden onset of weakness, nausea and sweating without a clear cause.

Pain—usually described as squeezing. It is substernal and perceived as radiating to the jaw, left arm or both arms. It is unrelated to exertion and not relieved by rest.

Arrhythmia and fainting.

Pulmonary edema.

Sudden death.

Pulse usually increases.

Blood pressure falls.

Respirations are normal unless pulmonary edema develops; then respirations are rapid and shallow.

Patient appears frightened and may be sweaty and pale gray in color.

Emergency Care

Emergency care for patients suspected of having a heart attack:

Place the patient in a semi-reclining position (position of comfort).

Administer oxygen by face mask.

Do not allow the patient to assist in moving himself.

Comfort and reassure patient.

Loosen patient's clothing.

Prepare to administer CPR if cardiac arrest occurs. Provide prompt and efficient transport.

Angina Pectoris is pain which occurs when the heart needs more oxygen than is available. It is usually brought on by stress or unusual effort.

The patient suffers pain in the chest; it may radiate to the jaw or arms. It is felt as a pressure or squeezing sensation.

Patients are usually aware of their condition and have been given medication (nitroglycerine) by their physician to relieve the pain; assist them in taking any prescribed medication.

Administer oxygen and place in a position of comfort.

Congestive Heart Failure Occurs

When the heart does not pump blood efficiently to the body, fresh blood cannot enter the heart from the lungs. Blood and other fluids accumulate in the lungs.

Signs/Symptoms may include the following:

Shortness of breath

Anxiety

Rapid heart rate

Rales or wheezing sounds

Normal or somewhat high blood pressure

Distended neck veins

Emergency care for this patient is the same as that for heart attack patients.

Stroke

A stroke is also known as a cerebrovascular accident or CVA; it is an interruption of blood flow long enough to cause damage to the brain.

Part of the brain has been damaged due to a blood clot, embolus or rupture of an artery. A clot may have formed elsewhere in the body and traveled to the brain as an embolus.

Signs of a **CVA** include:

Numbness or paralysis of the extremities, often unilateral

Confusion or dizziness

Difficulty with speech or vision

Diminished consciousness; coma

Convulsions

Headache alone

Incontinence

Emergency Care. Care will depend on the signs exhibited by the particular patient. Major consideration is calm treatment and careful handling, particularly of paralyzed parts. The airway must be monitored continuously.

Note: Even though the patient may not be able to speak and appears unconscious, he may be able to hear and understand what is being said—be careful what you say in front of such patients.

Dyspnea is defined as a sensation of shortness of breath.

It may be caused by medical or traumatic incidents.

Medical problems include:

Acute pulmonary edema

Airway obstruction by aspiration of vomitus or foreign objects—discussed previously.

Pulmonary diseases:

Chronic obstructive lung disease (emphysema or chronic bronchitis).

Asthma or allergic reactions.

Hyperventilation.

With **Chronic Obstructive Pulmonary Disease** patients the respiratory center may be so depressed that the patient does not have a stimulus to breathe.

Signs/symptoms of **COPD** include:

Respiratory distress—wheezing on expiration; difficult expiration; increased respiratory rate.

Tension and anxiety.

Blood pressure possibly slightly elevated.

Cyanosis.

Emergency Care includes:

Reassure the patient.

Administering oxygen by VENTURI MASK.

Assisting patient in taking his own medication.

Hyperventilation is caused by: over-breathing usually due to psychological stress.

The **Signs** of hyperventilation are:

Anxiety, terrified of death.

Dizziness and fainting.

Numbness or tingling of hands and feet.

Stabbing chest pain.

Rapid breathing.

High pulse rate.

Emergency Care should include:

Reassuring the patient and,

Asking the patient to breathe into paper bag.

Study Suggestions

1. You have examined each patient (and questioned relatives and/or bystanders as appropriate) and suspect that each is suffering from one of the conditions listed below. Describe what made you suspect each condition and how you would care for the patient.

   a. Heart attack.

   b. Chronic obstructive lung disease.

   c. Anaphylactic shock.

   d. Bronchial asthma.

   e. Bite by a coral snake.

2. You have patients exhibiting the signs and/or symptoms listed below. What might be wrong with each patient (include all possible conditions)? What other signs or symptoms might you check for? How would you care for each patient?

   a. The patient is dizzy and has a headache. His speech is slurred and he appears confused.

   b. The patient is breathing rapidly and has a stabbing chest pain.

c. The patient has obvious respiratory distress and is wheezing on expiration.

d. The patient is in a closed car with the engine running. He is unconscious and his face is pink.

e. From the odor, the child appears to have swallowed gasoline from the lawn mower.

f. The patient is in obvious respiratory distress. He is elderly and has a barrel-like chest.

Lesson 20
Medical Emergencies II

Introduction

This lesson continues coverage of common medical conditions. It includes discussions of causes, signs and emergency care for diabetic conditions, the acute abdomen, communicable diseases, patients with abnormal behavior, alcohol and drug abuse and epilepsy. It also includes a review of common problems in caring for child patients and practice in assessing a patient's condition. The EMT should be able to recognize medical conditions and special problems in children in order to render appropriate emergency care.

Objectives

At the conclusion of Lesson #20, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- Define diabetes.
- Describe the purpose and functions of insulin.
- List signs/symptoms of diabetic coma.
- List signs/symptoms of insulin shock.
- List steps in treatment of conscious diabetic patient.
- List steps in treatment of unconscious diabetic patient.
- Describe causes of insulin shock.
- Describe causes of diabetic coma.
- Define acute abdominal distress.
- List signs/symptoms of acute abdominal distress.
- List steps in the treatment of a patient with acute abdominal distress.
- List 4 special steps that should be used when examining a patient with acute abdominal distress.
- List 3 ways a communicable disease can be transmitted.
- List steps EMTs can take to lessen personal exposure to a communicable disease.
- List steps EMTs must take in the maintenance of the emergency vehicle post-exposure to a communicable disease.
- List 6 signs/symptoms of a patient who has abused chemical substances.
- List the general treatment procedures to be taken when caring for substance abuse patients.
- Define seizure.
- Define convulsion.
- List steps in the emergency care of a patient during and post seizure/convulsion.
- Describe the treatment for status epilepticus.
- Demonstrate obstructed airway maneuvers in infants to AHA standards.
- Demonstrate infant rescue breathing according to AHA standards.
- Demonstrate infant CPR according to AHA standards.
- List signs/symptoms of croup and epiglottitus.
- List steps in treatment of croup/epiglottitus.
- State normal vital signs in children.
  - —Newborn
  - —1 year
  - —3 years
  - —6 years
- List steps in managing fevers in children.
- List steps in treating child victim of ingested poisoning.

Overview Of Lesson Contents

Diabetes

Diabetes is a condition in which the body is unable to use sugar normally. All body cells need sugar to survive. Insulin is necessary to permit sugar to pass from the bloodstream to body cells. If there is not enough insulin, sugar will be unable to get to body cells and they will starve. If there is too much insulin, there will be insufficient sugar in the bloodstream and brain cells will be damaged since they need a constant supply of sugar.

Diabetic Coma occurs when:

There is insufficient insulin and therefore too much sugar in the blood and not enough in the body cells. The patient:

Has eaten too much food that contains or produces sugar, or has not taken his insulin.

The diabetic coma patient may exhibit some or all of the following signs:

A sweet or fruity (acetone) odor.

Rapid, weak pulse.

Air hunger–rapid, deep breathing.

Varying degrees of unresponsiveness, up to coma.

Normal or slightly low blood pressure.

Note: The onset of diabetic coma is gradual.

This patient needs immediate transportation to a medical facility.

Insulin Shock (Overdose) occurs when:

There is too much insulin in the body; therefore, the sugar leaves the blood rapidly and there is insufficient sugar for the brain cells. The diabetic:

Has taken too much insulin, or

Has not eaten enough food, or

Has exercised excessively.

Signs include the following:

Full, rapid pulse.

Normal breathing.

Dizziness, headache.

Fainting; seizures; disorientation; coma.

Normal blood pressure

Note: The onset of insulin shock is sudden; it may occur within minutes.

The patient desperately needs sugar before brain damage and death occur. Sugar in any form can be given to a conscious patient. Both the conscious and unconscious patient need immediate transportation to a medical facility.

Note: If the EMT-A can't distinguish between diabetic coma and insulin shock and sugar is available, have the conscious patient take it. It can't appreciably hurt the patient in diabetic coma and may save the life of a patient in insulin shock. Transport unconscious patients without delay, **Do Not Administer Sugar Or Other Oral Glucose Agents To Unconscious Patients.**

Acute Abdominal Distress

The term means abdominal distress caused by irritation or inflammation of the peritoneum.

Signs may include:

Abdominal pain, local or diffuse.

Abdominal tenderness, local or diffuse.

Patient is quiet and reluctant to move.

Rapid shallow breathing.

Rapid pulse.

Low blood pressure.

Tense, often distended, stomach.

Position of the patient.

Special Examination Procedures, should be completed including:

Determining whether the patient is restless or quiet and whether movement causes pain.

Feeling the abdomen gently to see if it is tense or soft.

Determining whether the patient can relax the abdominal wall on command.

Determining whether the abdomen is tender when touched.

The patient in acute abdominal distress needs speedy but prudent transportation to a medical facility. Care includes:

Keep airway clear.

Administer oxygen if necessary.

No liquids or food.

No medication.

Position patient comfortably.

Prevent and manage shock as appropriate.

Common Communicable Diseases include:

Chicken pox	Pneumonia
Diphtheria	Poliomyelitis
German measles	Rocky Mountain spotted fever
Gonorrhea	Smallpox
Malaria	Scarlet fever
Measles	Syphilis
Meningitis	Tuberculosis
Mononucleosis	Typhoid fever
Mumps	Whooping cough

Communicable Diseases Are Transmitted By: Direct contact, indirect contact or inhalation.

If nature of call is known in advance:

Wear disposable gown and mask, remove all unnecessary equipment from the vehicle and use as much disposable equipment as possible.

Upon returning from the call perform the following as appropriate:

Boil clothing.

Wash hands.

Shower.

Follow the latest medical recommendations for vaccination, immunization and decontamination.

Substance Abuse

Alcohol is a depressant that affects a person's judgment, vision, reaction time and coordination. In very large quantities, it can cause death by paralyzing the respiratory center in the brain.

Signs of alcoholic intoxication.

Odor of alcohol on breath.	Nausea/vomiting.
Swaying/unsteadiness.	Flushed face.
Slurred speech.	

Remember that these signs can mean illnesses or injuries other than alcohol (e.g., epilepsy, diabetes, head injury). It is therefore especially important that the person with alcohol on his breath (which can smell like the acetone breath of a diabetic) not be immediately dismissed as a drunk. He should be carefully checked for other illnesses/injuries.

When alcohol is taken in combination with analgesics, tranquilizers, antihistamines, barbiturates, etc., the depressant effects will be added together and, in some instances, the resultant effect will be greater than the expected combined effects of the two drugs.

The intoxicated patient should be given the same attention given to patients with other illnesses/injuries.

The intoxicated patient needs constant watching to be sure that he doesn't aspirate vomitus and that he maintains respirations.

An alcoholic who suddenly stops drinking can suffer from severe withdrawal problems.

Sudden withdrawal will often result in DT's (delirium tremens).

Signs include:

Shaking hands.
Restlessness.
Confusion.
Hallucinations.
Sometimes disruptive behavior.

The patient must be protected from hurting himself.

Drugs:Types

Uppers—Stimulants of the central nervous system. They include amphetamines, cocaine, caffeine, anti-asthmatic drugs and vasoconstrictor drugs.

Downers—depressants of the central nervous system. They include barbiturates, tranquilizers, marijuana, inhaled solvents and opiates.

Hallucinogens—they include LSD, mescaline, psilocybin and peyote. Marijuana also has some hallucinogenic properties.

Withdrawal from barbiturates can cause anxiety, tremors, nausea, fever, delirium, convulsions and ultimate fatality.

Withdrawal from opiates may include, among others, intense agitation, abdominal discomfort, dilated pupils, increased breathing and body temperatures and a strong craving for a "fix".

Emergency care for substance abuse patients include:

Inducing vomiting if the overdose was taken orally in the preceding 30 minutes.

Protect hyperactive patients from hurting themselves and others. They should be reassured and treated calmly.

Level of consciousness should be monitored and recorded.

Respirations should be carefully monitored since overdoses of depressants can cause respiratory depression and death.

The EMT should instill confidence.

The EMT should be alert for possible allergic reactions and shock.

Evidence should be preserved in cooperation with law enforcement agencies.

Prompt transportation should be provided.

Epilepsy is a neurological disorder manifested by seizures.

Most seizures are controlled by medication.

Common Types.

Petit Mal Seizures are the most common form and result in only a momentary loss of awareness.

Grand Mal Seizure

The patient convulses due to a sudden abnormal stimulation of brain cells. The

convulsions are tonic and clonic. The convulsions are usually followed by unconsciousness called a postictal state.

Status Epilepticus

Continuous seizure activity without regaining consciousness.

Transport immediately.

The major requirements of the rescuer is to protect the patient from hurting himself during a seizure.

The epileptic should not be physically restrained in any way unless he is endangering his own welfare.

Move objects, not the patient in an effort to protect him.

He may need to be transported to a medical facility when the seizure is over; allow him to help you make the decision.

Do Not force foreign objects into the patient's mouth during seizures.

Problems Of Child Patients

Techniques of care for children are essentially the same as those for adults with some variations being necessary due to size.

Approach

There are special problems in dealing with children since they are apt to be afraid or unable to communicate, for example:

Fear

Of the accident scene—confusion, noise, cries of the injured, view of injured particularly if the injured are his parents.

Inability To Communicate

Too young or too frightened to communicate verbally.

The EMT should be reassuring, calm and understanding with child patients. Use simple language and a soft voice. Be very gentle in feeling for injuries.

Problems Related To Pediatric Patients

Fever. A child with an unusually high fever should be cooled before and during transport.

Convulsions. Convulsions are common in young children and frequently associated with fever. The convulsing child needs to be protected from injuring himself.

Croup And Epiglottitus. Partial airway obstruction which develops over a long period of time. Do not use obstructed airway maneuvers, administer humidified oxygen and transport immediately.

Sudden Infant Death Syndrome. Death usually occurs during sleep in an apparently healthy baby. The EMT will encounter anguished parents and should endeavor to assist the baby by administering CPR.

Child Abuse. The EMT-A should be alert to indications of child abuse and report suspicions to medical and other appropriate personnel.

Sexual Abuse. Children of both sexes are subject to sexual molestation. The patient should not be examined unless there is obvious bleeding that requires control. The patient should not wash, urinate or defecate.

Poisoning. Common in children. Treatment procedures are the same as an adult, except ipecac dose is reduced to 1 tablespoon. Follow the recommendations of the Poison Control Center.

VITAL SIGNS RANGES

Blood pressure

Ages	Mean Systolic	Mean Diastolic
Neonate	80	46
6-12 Months	89	60
1 year	96	66
2 years	98	64
6 years	100	56
12 years	114	60

Pulse Rate:

Age	Pulse Rates
Neonates	110-150
12 Months	100-140
2 years	90-110
6 years	80-100
10 years	70-110

Respiratory Rate:

Age	Respiratory Rate
Neonate	30-50
2 years	20-30
10 years	14-22
Adolescent	12-20

Study Suggestions

1. You have examined each patient (and questioned relatives and/or bystanders as appropriate) and suspect that each is suffering from one of the conditions listed below. Describe what made you suspect each condition and how you would care for the patient.

   a. Diabetic coma.
   b. Alcohol withdrawal.
   c. Grand Mal seizure.
   d. Heroin overdose.
   e. Appendicitis.

2. You have patients exhibiting the signs and/or symptoms listed below. What might be wrong with each patient (include all possible conditions)? What other signs or symptoms might you check for? How would you care for each patient?

   a. The patient is dizzy and has a headache. His speech is slurred and he appears confused.

   b. The patient smells of beer and is very unsteady.

   c. The child has fallen from a tree. He has no obvious fractures. He is unconscious, and his systolic blood pressure is 55 mm Hg.

   d. The baby has been found in his crib by his parents. He has no respirations or pulse.

   e. When you enter the patient's bedroom, he announces that he has just taken all his sleeping pills. An empty bottle is on the bedside table.

3. The child is unconscious and has multiple severe bruises all over his body. His parents tell you he fell down the stairs.

4. You have been informed that the patient you will be transporting has chicken pox. Describe precautions you would take before, during and after the run to protect yourself and minimize spread of the disease.

5. You have just made an ambulance run in which you transported a patient with small pox. Describe precautions you would take to protect yourself and minimize spread of the disease.

Lesson 21
Emergency Childbirth

Introduction

A childbirth can be an emergency event and knowledge of appropriate procedures will permit better care of both patient and baby. The lesson covers normal and abnormal births and provides for students to practice skills in assisting in deliveries and caring for the mother and the newborn.

Objectives

At the conclusion of Lesson #21, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- —Identify on a diagram the following:
  - —Uterus
  - —Cervix
  - —Vagina
  - —Fetus
  - —Placenta
  - —Umbilical Cord
  - —Amniotic sac
  - —Perineum
- —Define:
  - —Miscarriage/abortion
  - —Bloody show
  - —Crowning
  - —3 stages of labor
  - —Presenting part
- —List and state purpose of emergency OB kit.
- —List pre-delivery emergencies and state their emergency care.
- —List 3 indications of an imminent delivery.
- —List steps involved in pre-delivery preparation of mother.
- —List steps to assist in the delivery.
- —Describe (demonstrate) care of baby as soon as head appears.
- —Demonstrate infant resuscitation procedures (including use of oxygen).
- —Describe how/when to cut cord.
- —List steps to assist in delivery of placenta.
- —List steps in the care of mother post delivery.
- —List special considerations for multiple births.
- —Define premature baby and describe special considerations for care of.
- —Describe/demonstrate procedures for:
  - —Breech birth
  - —Prolapsed cord
  - —Arm/leg presentation
- —List steps in care of mother with excessive bleeding.

Overview Of Lesson Contents

Relevant Anatomy, Physiology And Terms

- Fetus
- Uterus
- Birth Canal
- Placenta (Afterbirth)
- Umbilical Cord
- Amniotic Sac (bag of water)
- Cervix
- Vagina
- Perineum
- Crowning
- "Bloody Show"
- Labor
  - First Stage
  - Second Stage
  - Third Stage
- Presenting Part
- Abortion
- Live Birth Certificate
- Fetal Death Certificate

Pre-Delivery Emergencies

For Convulsions: Resulting from epilepsy or toxemia, the EMT should:

Place mother on side.

Upon regaining consciousness, elevate shoulders and head.

Give oxygen.

For Heart/Lung Complications the patient should be given oxygen.

If the patient is **Hemorrhaging,** procedures are:

Do Not examine vaginally.

Administer oxygen.

Maintain body temperature.

Encourage mother to lie on her side.

Pneumatic counter pressure device may be used (legs only) if indicated.

INITIAL CONSIDERATIONS

It is generally best to transport the mother unless the delivery is expected in a few minutes.

To determine when the delivery is expected ask:

Has the mother had a baby before?

Does she feel she has to strain or move her bowels?

Is the vagina bulging or is baby crowning?

Precautions include:

Look, do not touch.

Do not let mother go to bathroom.

Do not hold mother's legs together.

NORMAL DELIVERY. Procedures are:

Have mother lie with knees drawn up and spread apart. If in automobile, have mother place one foot on the floorboard.

Place sheet, blanket, or newspaper under buttocks to lift them about 2 inches off the surface.

Fold sterile towel and place under buttocks.

Place another sterile towel on patient's abdomen and one on surface below opening of vagina.

When the baby's head appears, place the fingers of the gloved hand on its head and exert VERY GENTLE pressure.

If the amniotic sac does not break, use clamp to puncture sac and push sac away from baby's mouth and nose.

When the head is born, check if umbilical cord is around neck; slip over shoulder or clamp, cut and unwrap.

Place hand under baby's head for support and suction baby's mouth two or three times and each nostril once.

As the abdomen and hips are born, place the other hand under those parts—there are now two hands supporting the baby.

When feet are born, grasp feet.

Wipe blood and mucus from mouth and nose with a sterile gauze, suction mouth and nose again.

Wrap baby in a blanket and place on its side, head slightly lower than trunk.

Clamp, tie and cut umbilical cord.

Massage uterus.

Observe mother for delivery of placenta—few to 30 minutes; if over 20 minutes, transport. If heavy bleeding, transport. Massage uterus, administer oxygen, place sterile pad over vagina.

When delivered, wrap placenta in towel and put in plastic bag; 1/2 pint blood normal. Place sterile pad over vaginal opening, lower mother's legs, help her hold them together.

Record time of delivery and transport mother, baby and placenta to hospital.

Note: If baby does not deliver after 20 minutes of contractions every 2 to 3 minutes, transport immediately.

RESUSCITATION OF THE NEWBORN. Procedures are:

Suction airway as previously described.

Lay baby on side, head lower than body.

Snap index finger against bottom of feet; if no response:

Apply GENTLE mouth-to-mouth/nose resuscitation.

Continue resuscitation until breathing starts; then oxygen.

Initiate cardiopulmonary resuscitation if no pulse after 2 minutes.

Continue cardiopulmonary resuscitation until baby breathes or is pronounced dead by a physician.

BREECH DELIVERY. Procedures are:

Make same preparations as for normal delivery.

Allow buttocks and trunk to deliver spontaneously.

Support legs and trunk.

Allow head to deliver spontaneously.

If head does not deliver in 3 minutes, transport immediately. Do not pull baby out. Provide airway.

After head delivers, continue as in normal birth.

If only foot or arm protrudes, transport to hospital immediately.

Prolapsed Cord. Procedures are:

Put mother in shock position—legs elevated, give oxygen, keep hips elevated.

Wrap a sterile towel around the visible portion of the cord. Do not replace or put pressure on cord. The baby may have to be supported to relieve pressure on the cord.

Transport immediately.

Excessive Bleeding. (more than 5 soaked pads). Procedures are:

Prevent shock.

Pneumatic counter pressure device may be useful.

Place sterile sanitary napkin at opening of vagina; save blood-filled pads.

Do not hold legs together or put hand or anything in vagina.

Preserve any tissue passed.

Transport immediately.

Abortion (Miscarriage). Procedures are:

Prevent shock.

Pneumatic counter pressure device may be useful.

Immediately transport.

Save any passed tissue.

Multiple Birth—procedures are the same as for single births.

Premature Infant

Characteristics—usually thinner, smaller and redder than a full-term baby with a relatively large head.

Care

- Keep the baby warm.
- Keep the mouth and throat clear of fluid and mucus.
- Ensure cord does not bleed.
- Administer oxygen.
- Don't infect infant.
- Alert hospital.

Premature Infant Carrier. Procedures are:

- Fill hot water bottles, cover and place in carrier.
- Wrap infant in blanket or napkin.
- Make sure carrier is secure in ambulance.

Study Suggestions

1. You are transporting an expectant mother to the hospital when she starts to convulse. Describe how you would care for her.
2. You have arrived at the scene and find the expectant mother straining as if she has to move her bowels. What would you do?
3. If an obstetrical manikin is available, practice procedures involved in normal and breech deliveries. Have a classmate maneuver the infant manikin.
4. Identify all equipment and materials required for delivery of a baby and describe their use.
5. Describe what is meant by a prolapsed cord and the care you would provide in the event of such an emergency.
6. You have assisted in the delivery of a baby. You have suctioned the infant's airway but no respiration is apparent. Explain what you would do.
7. You have assisted in the delivery of a premature infant. Describe how you would care for the infant before and during transport.
8. The baby's head has delivered but the amniotic sac is intact. What would you do and why?

Lesson 22
Burns and Hazardous Materials

Introduction

Proper management of patients suffering from buns or exposure to hazardous materials can save lives and limbs as well as minimize suffering. It is of critical importance that the EMT-A recognize hazardous material situations to protect himself and others.

Objectives

At the conclusion of Lesson #22, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- List 2 functions of skin.
- Define and state 2 characteristics each of 1st degree, 2nd degree, and 3rd degree burns.
- Demonstrate knowledge of rules of 9's by dividing picture of human body into appropriate areas.
- List 3 examples of a critical/severe burn.
- List 3 examples of a moderate burn.
- List 2 examples of a minor burn.
- List 3 steps in management of chemical burns.
- List precautions to take at scene of electrical burn.
- List steps in treatment of electrical burn.
- State the local agency responsible for handling nuclear wastes/to be contacted in case of accidents involving nuclear radiation.
- State how exposure to radiation affects severity of burns.
- List 7 steps to manage emergency scene involving hazardous material.

Overview Of Lesson Contents

Burns

Burns are classified by degree of damage to the skin.

First-Degree Burns. In a first-degree burn, only the top layer of skin is burned and the skin becomes reddened.

Second-Degree Burns. In a second-degree burn there is some damage to the dermis and characteristically the skin blisters.

Third-Degree Burns. In a third-degree burn the entire thickness of the skin is burned down to the subcutaneous fat. The skin usually is dry, pale or white but may be brown or even charred. There is a loss of sensation in the area due to a destruction of nerve endings.

The rule of nines provides a means of estimating the percentage of the body that is burned as follows:

	Adult	Infant
a. Head	9%	18.0%
b. Arms	9% ea. (18%)	9.0% ea. (18%)
c. Torso front	18%	18.0%
d. Torso back	18%	18.0%
e. Genitalia	1%	1.0%
f. Legs	18% ea. (36%)	13.5% ea. (27%)
	100%	100.0%

The degree of seriousness of a burn can be estimated from the following:

Degree of the burn.

Percentage of body burned.

Location of the burn.

Accompanying complications.

Age of patient.

Note: The general condition of the patient must also be considered. For example a moderate burn in an aged or critically ill person might be critical.

The following burns are considered critical:

Burns complicated by respiratory tract injuries and other major injuries or fractures.

Third-degree burns involving the critical areas of the face, hands, feet and genitalia.

Third-degree burns covering more than 10% of the body surface.

Second-degree burns covering more than 30% of the body surface.

Moderate Burns are considered to be those:

Third-degree burns of 2 to 10% of the body surface excluding face, hands, feet and genitalia.

Second-degree burns of 15 to 30% of the body surface.

First-degree burns of 50 to 75% of the body surface.

The general condition of the patient must also be considered. For example, a moderate burn in an aged or critically ill person might be serious.

Management of burns should include:

Stopping the burning process, removing smoldering clothing.

Covering with a clean dressing and maintaining body heat.

Administering oxygen.

NEVER use grease (e.g., butter, lard, vaseline) on a burn.

For **Chemical Burns** the patients needs speedy access to water.

Chemicals in contact with the skin should be washed off with copious amounts of water as clothing is being removed, with the exception of lime (which may be brushed off the skin).

For chemicals in the eye, the EMT may need to hold the patient's eye open for him and rinsing should continue for up to 20 minutes.

Electrical Burns can be more serious than they appear since they can penetrate the skin deeply; the burn commonly enters in one place and leaves the body in another so that there are two wounds.

The major problem with electrical burns is respiratory and cardiac arrest.

If there are fallen wires or other electrical hazards, the power company or appropriate rescue group should be summoned immediately.

Unless the power company says the power is off, it should be assumed that it is on even though street lights are off.

Patients should be told to STAY IN THE VEHICLE.

If there is a fire, they must jump from the vehicle (a child should be thrown from the vehicle). They must not make contact with the vehicle and the ground simultaneously.

Radiation

Radiation burns may be nuclear or solar. Since solar burns are basically sunburns, they should be treated as any other first or second degree burn. The remainder of the session will therefore be devoted to nuclear burns.

Radiation is a form of energy transmission.

Ionizing radiation (alpha, beta and gamma rays) affects the body cells.

Alpha and beta particles are dangerous only if swallowed or inhaled—they damage internal organs.

Gamma rays are very penetrating and dangerous.

The amount of radiation damage depends on:

Strength of the source.

Type of radiation exposure.

Duration of exposure.

Area of body affected.

Distance between person and source.

Shielding between person and source.

If a hazardous radiation level exists, the patient should be removed from the area as quickly as possible even if some of the rules of initial emergency care are violated.

If there is reason to suspect that there are radioactive materials on the patient's or rescuer's clothes, they should be removed at the edge of the exposed area and disposed of in labeled metal containers with tight lids.

Both EMT-A and patient should shower.

Standard decontamination procedures should be followed for EMT, patient and ambulance. The hospital should be notified.

Hazardous Materials are becoming a common problem.

The extent of the problem is unknown; however contact with hazardous materials is far more likely than radiation exposure.

Safety is the primary concern in managing a hazardous material situation. Safety precautions must be initiated to protect the EMT, the public and the patient.

EMT-A

Public

Patient

Resources are available and should be used in hazardous material situations including:

CHEMTREC 1-800-424-9300

Hazardous Materials: Emergency Response Guidebook

(DOT P5800.2) (1980)

State and local agencies.

Recognition and identification of hazardous material situations is critical, information may be obtained from:

Placards, 4 digit number

Shipping paper, 4 digit number or name.

General procedures for controlling a hazardous materials situation include:

Keep unnecessary people away

Stay upwind, safe distance

Isolate the area.

Keep people out

Do not enter until fully protected with suit and self contained breathing apparatus.

Avoid contact with the material

Remove patient to safe zone.

Institute CPR and give oxygen as indicated. Treat major injuries.

If material contact has occurred, flush with water for at least 15 minutes.

Remove and isolate contaminated material.

Decontaminate self, equipment and ambulance as directed.

Study Suggestions

1. You have examined each patient (and questioned relatives and/or bystanders as appropriate) and suspect that each is suffering from one of the conditions listed below. Describe what made you suspect each condition and how you would care for the patient.

   Radiation exposure.

   Hazardous material exposure.

2. The patient has second-degree burns covering both legs. There is an open fracture of the tibia on the right leg. How would you care for him?
3. What would you do if your vehicle was exposed to gamma rays?
4. Identify State or local agencies who can assist in a hazardous material response.

Lesson 23
Environmental Emergencies

Introduction

Exposure to the environment can lead to life-threatening medical problems. The EMT-A must be prepared to provide proper treatment in those situations caused by heat, cold and water.

Objectives

At the conclusion of Lesson #23, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- List 2 signs/symptoms of heat cramps.
- List steps in emergency care of heat cramps.
- List 3 signs/symptoms of heat exhaustion.
- List steps in emergency care of heat exhaustion.
- List 3 signs/symptoms of heat stroke.
- List steps in emergency care of heat stroke.
- List and define 5 ways the body loses heat.
- Define hypothermia.
- List 5 signs/symptoms of hypothermia.
- List 3 steps in emergency treatment of a hypothermic patient when transport time is less than 30 minutes from a medical facility.
- List 3 steps in emergency treatment of a hypothermic patient when transport time is greater than 30 minutes from a medical facility.
- List signs/symptoms of frostbite.
- List circumstances when frostbite should not be thawed outside of a medical facility.
- State the temperature at which water should be maintained when thawing frostbitten parts.
- List steps in emergency treatment of a drowning victim.
- List 5 steps in care of patients with suspected diving-related problem(s).
- Define air embolism (from diving).
- Define decompression sickness.
- State how to contact nearest recompression chamber.

Overview of Lesson Contents

Exposure to Heat

A patient may suffer painful muscle spasms known as heat cramps in the extremities after strenuous exercise.

The cramps will usually be relieved if the patient takes a salt solution.

The most common illness caused by heat is heat exhaustion.

The patient is usually weak, dizzy or faint, has a headache, no appetite and nausea. Vital signs are usually normal. He may appear gray and skin may be cold and clammy.

It occurs when patient works hard in a hot environment.

Muscles and heart need increased blood flow as does the skin.

The patient should be treated as if he were in shock and should be transported to a medical facility if indicated. One liter of one-half strength electrolyte solution may be provided if the patient is conscious.

In heat stroke, the patient's sweating mechanism has broken down and he is unable to lose body heat through the skin.

Important signs are:

Very hot, dry skin.

Coma or a progressive deterioration of responsiveness.

Very high body temperature.

This condition is a true emergency. If body temperature rises too high, brain cells can be injured and the patient may die.

The body should be cooled in any way possible (e.g., cold towels, air from a fan) while the patient is transported to a medical facility where they will likely give the patient an ice-water bath to lower the temperature.

Exposure to Cold.

There are five major ways in which the body loses heat:

Conduction	Respiration
Convection	Radiation
Evaporation	

General Cooling of the Body is Known as Hypothermia.

Exposure to cold, snow or ice can result in a general cooling of the body that can go through the following five stages:

Shivering—an attempt by the body to generate heat. (Does not occur below 90 degrees (F).)

Decreased muscle function—first, fine motor, then gross motor.

Decreased level of consciousness.

Decreased vital signs, slow pulse and slow respiration rate.

Apparent death.

Hypothermia is an acute emergency requiring immediate medical attention. Emergency care includes:

If less than 30 minutes from medical facility:

prevent further heat loss.
handle with care.
add heated oxygen.
transport.

If more than 30 minutes from a medical facility:

prevent further heat loss.
handle with care.
add heated oxygen.
rewarm patient.
prepare for CPR.
transport.

With any hypothermia patients, always monitor respirations and pulse and provide pulmonary and cardiopulmonary resuscitation as required. Resuscitate all hypothermia patients. No one is considered dead until they are warm and dead.

Local Cooling of the Body may result in frostnip or frostbite.

When the body is subjected to excessive cold, the water in cells will freeze; the resulting ice crystals may even destroy the cells.

It may be minor (frostnip), superficial, or deep.

NEVER rub any condition of frostbite; the ice crystals in the tissue can cut and destroy cells.

In frostnip there is a sudden blanching of the skin—the patient is usually unaware of it.

The skin can be warmed by applying firm pressure with a hand (no rubbing) or other warm body part or by blowing hot breath on the spot.

The skin in **Superficial Frostbite** appears white and waxy; it is firm to the touch but the tissue beneath is soft and resilient.

Treatment includes providing dry coverage and steady warmth.

Deep Frostbite occurs when there is actual freezing of the tissue.

The skin is white and feels hard throughout.

This patient needs immediate hospital care. He should be kept warm and resuscitated as necessary.

Treatment of deep frostbite includes:

Rewarm the affected part by immersion in water 105 degrees (F).

Administer oxygen.

Maintain core temperature.

Transport.

NOTE: Do not delay transport for rewarming. NEVER rub any condition of frostbite; the ice crystals in the tissue can cut and destory cells.

Near Drowning

In most drownings, little water enters the lungs since a laryngeal spasm occurs when foreign material is introduced into the larynx.

Direct swimming rescue should be attempted only by personnel trained in lifesaving. Instead, floatable items should be thrown or pushed to the victim.

Immediate pulmonary resuscitation is necessary—before patient is removed from water. CPR must be delayed until the patient is on a hard, flat surface.

If there is a possibility of a diving accident, the patient should be removed from the water on a backboard.

Pulmonary and cardiopulmonary resuscitation should be provided as required.

All pulseless, non-breathing patients submerged in cold water less than 70 degrees (F) should be resuscitated.

Diving Problems

In addition to resuscitation problems, two ascent problems require recompression: air embolism and bends (decompression sickness).

Air Embolism is caused when:

Water pressure on the chest is rapidly reduced and air within the lungs expands. Too rapid expansion ruptures alveoli and damages adjacent blood vessels. A pneumothorax and air embolism can result.

Signs include:

Blotching or itching of skin.

Froth in nose and mouth.

Pain in muscles, joints, tendons, abdomen.

Difficult breathing with chest pain.

Dizziness and vomiting.

Difficulty in seeing properly.

Possible paralysis and coma.

Care for air embolism patients:

Provide basic life support and oxygen.

Place patient on his left side with head and chest lower than feet.

Transport to nearest emergency medical facility.

The Bends are caused when nitrogen is released into the system too quickly.

In a rapid ascent, bubbles become larger and may obstruct the vessels in which they lie.

SIGNS. Signs range from minor skin rashes and joint pains to serious central nervous system complaints. It is called the bends since patient typically bends over from joint pain.

Care procedures are:

Provide basic life support with oxygen.

Transport to recompression chamber.

Pneumothorax may be caused by excessive pressure in the alveoli resulting in spontaneous rupture.

Signs/Symptoms include severe chest pain and dyspnea. Treat as for other pneumothorax.

Study Suggestions

1. The patient has been playing tennis at midday. He is dizzy and has a headache. His speech is slurred and he appears confused. List all possible conditions that might be wrong with the patient. What other signs or symptoms would you check for? How would you care for the patient?

2. The patient fell asleep in the sun. He was wearing bathing trunks. He is shivering and has first-degree burns covering all exposed parts of his body. How would you care for him?

3. An automobile accident is discovered at 6 a.m., evidence suggests that the accident occurred sometime the night before. The patient is unconscious and cold to the touch. Extrication and transport will require a 1 hour delay to the hospital.

4. Describe the procedures for care of deep frostbite.

Lesson 24
Psychological Aspects of Emergency Care

Introduction

The EMT-A must be able to communicate effectively with every patient to optimize care. Certain patients present a difficult challenge to the communication process, special training and skills are necessary. Emergency care situations may be very stressful. The EMT must assist patients, bystanders and himself to cope with such stress.

Objectives

At the conclusion of Lesson #24, the instructor will have provided sufficient information, demonstration and practice to the student, to ensure his/her ability to:

- Define communication
- List 8 general principles of communication.
- List 2 methods of applying general principles of communication with each of the following groups of patients:
  - —Geriatric
  - —Pediatric
  - —Deaf
  - —Blind
  - —Non-English speaking
  - —Mentally retarded/ developmentally disabled
  - —The confused patient.
- List 6 possible causes for patients displaying disruptive behavior.
- List 4 steps the EMT can take to stabilize a disruptive situation.
- Demonstrate two methods of restraining and transporting patients in the ambulance.
- List four possible responses that a patient's family member may have to sudden death.
- List four possible responses that the EMT may have to sudden death.
- List four possible responses the terminally ill patient may display.
- List four possible responses the family of a terminally ill patient may display.
- List four positive approaches the EMT may take to assist the patient of family in dealing with the effects of crisis.
- List four responsibilities of the EMT-A when responding to suspected child abuse incidents.
- List four signs/symptoms which should lend the EMT to suspect child abuse.
- List 8 signs/symptoms of EMT-A stress syndrome.
- List 4 positive steps the EMT-A may apply to relieve stress.
- List three responses the EMT's family and friends may display in times of stress.
- List three possible methods of relieving stress among the EMT's family and friends.

Overview of Lesson Contents

Principles of Communication.

Communication is: The act of expressing one's thoughts, needs and desires to another.

Communication Effectiveness may be increased by:

- Making contact with patient.
- Being direct and truthful.
- Communicating at the correct level.
- Being aware of nonverbal principles of communication.

Patients Which May Present Communication Challenges

- Don't assume senility or lack of understanding with geriatric patients. Procedures include:
- Use patient's name
- Check for hearing deficit
- Allow time for response
- Ask the patient what makes him most comfortable

Pediatric Patients

May be frightened or modest.

Move slowly and explain procedures in simple terms.

Allow the child to retain crutch, i.e., toy, blanket.

Be honest about pain which may be caused by procedures.

A parent or sibling may be useful to help calm the child.

Use eye level contact.

When dealing with **Deaf Patients.**

Determine if patient can read lips. If so:

- Speak slowly.
- Position self properly so that the patient can see you.

Know and use common sign language representation for:

- Sick,
- Hurt and
- Help

In come cases written messages may be useful.

When treating a blind patient determine if patient has hearing impairments. Don't shout or assume that the patient is also deaf.

Explain incident and procedures in detail before initiating treatment.

With Non-English Speaking Patients:

- Determine level of understanding.
- Use interpreter if available.
- Use gestures.
- Refer to written charts.

When Caring for Confused or Developmentally Disabled Patients, Procedures Include:

- Determining level of understanding
- Speaking at appropriate level
- Waiting for delayed response
- Speaking as you would to any adult
- Evaluating understanding and re-explain if necessary
- Listening carefully

Disruptive Behavior

Any behavior which presents a danger to the patient or others; or delays or prevents appropriate treatment is referred to as disruptive behavior.

Causes may include:

- Stress response, i.e., hysteria, aggression
- Alcohol
- Drugs
- Neurological trauma
- Metabolic imbalance
- Organic brain syndrome
- Psychiatric disorders, i.e., paranoid schizophrenia, suicidal, etc.

General Approach to Treatment

Assess situation

Protect self, patient and others

Take charge of the situation

Practice effective communication

Don'ts in caring for patients displaying disruptive behavior.

- Diagnose
- Judge
- Label
- Isolate self from team members

Do's

- Describe behavior
- Provide quality care
- Protect yourself

DEALING WITH THE EFFECTS OF CRISIS

CRISIS is a state of emotional turmoil which may develop over a long term or be caused by sudden disruption or stressful situations

Every emergency patient is in a potential crisis situation.

Specific Crisis Events:

Sudden Death

Caused by Trauma, Acute illness, M.I., Ruptured aneurisms, Diabetic emergencies, Renal failure, Sudden Infant Death Syndrome, etc.

The family response may include any of the following:

Denial	Delayed response
Guilt	Physiological response
Grief	Nausea
Hostility	Vomiting
Crying	Shock

The EMT's response may include feelings of:

Helplessness	Anger
Guilt	Frustration
Avoidance	

Other response may include:

Hyperclinical approach

Nightmares

Gallows humor or

Physiological responses

Treatment of Sudden Death

Resuscitate patient unless obviously dead according to State or local protocol, e.g., decapitation

Avoid stock phrases such as: "everything will be all right"

Keep the family informed, don't offer false hope, allow and accept emotional response, e.g., crying, one EMT-A may touch and empathize with family while others care for the patient.

Terminal Disease

Causes of terminal diseases may include:

Aging, cancer, congenital defects, etc.

The patients response to terminal illness follows the following pattern:

Denial	Depression
Bargaining	Acceptance
Anger	

Family response may fall into the same range as above, patient's response

They may be prepared and accepting

The EMT's response may include feelings:

Inadequacy or helplessness and may vary,

depending on the age of the patient.

Treatment of terminal disease problems:

Attempt to assess whether the patient and family is prepared for death.

Don't isolate the family

Encourage the feelings of patient and family and allow for patient's dignity in the dying process.

Resuscitate according to State and local protocol. Generally written physician orders are necessary to withhold resuscitation.

Victims of Abuse

Criminal activities including:

Beatings	Rape
Spouse abuse	Attempted murder

Patient's response may be:

Outrage	Hysteria
Disbelief	Depression
Withdrawal	

Treatment of victims of criminal acts provide:

Quality emergency medical care: commensurate with injuries

Maintain the chain of evidence, cooperate with law enforcement officials.

In sexual crimes don't allow the victim to bathe, douche, urinate, etc.

In treating the patient, disrupt or touch as little evidence as possible

Quickly mark body position before moving the patient, if possible

Provide emotional support and use a professional approach

Be aware of and follow all reporting requirements

Request specialized professional assistance e.g., rape counselors, etc. to help the patient.

Child abuse is a widespread problem involving:

5,000 deaths and

15,000 reported incidents annually

10% of all pediatric patients seen in the emergency room are victims of abuse and the problem knows no social or economic barriers

Types of abuse include:

Physical beatings	Failure to thrive
Emotional	Neglect
Sexual	

The EMT-A must be alert for signs and symptoms including:

Obvious wounds, particularly if they are bilateral

Signs of other injuries in various stages of healing

Wounds not commensurate with the description of the incident

Signs of malnutrition

Child is unkempt

Statements by the child

Frequent calls to the same address

Treatment of victims of child abuse require a calm approach. Procedures are:

Maintain a high index of suspicion, treat injuries, provide emotional support

Most importantly maintain a professional attitude

Don't judge

Avoid anger and retaliation

Maintain confidentiality

Know and follow all reporting requirements

STRESS RESPONSE BY THE EMT-A.

Emergency care is a high stress occupation

The EMT-A must recognize common signs and symptoms.

These include:

Irritability
Lack of enthusiasm
Chronic fatigue
Feeling unappreciated
Nightmares
Increased alcohol or drug use
Decrease in social activities
Wanting to quit
Changes in appetite
Physiological responses, headache, ulcers, muscle aches, inability to concentrate
Rigidity in thinking
Avoidance of change

Intervention to relieve stress.

Develop peer support

Develop achievable objectives

Change the environment

Show and accept emotional feelings

Counseling or professional help may be needed

Assessing career appropriateness

Continuing education to renew confidence

Maintain a sense of humor

Family and Friend's Response to EMTS

Family and friend may respond in a number of ways.

There may be a lack of understanding or

Fear of separation and being ignored

On call situations cause stress because you can't plan activities

The problem may be relieved by:

Planning time and sticking to it.

Share experiences, particularly successes. Informing family and friends about what you are doing, e.g., teach them CPR.

Study Suggestions

1. Practice at least 4 manual signs until you achieve proficiency.
2. Ask your family or friends what they think about your becoming an EMT.
3. Practice talking to a patient with a limiting communication capability such as an elderly person or a child.

Lesson 25
Lifting and Moving Patients

Introduction

Proper patient handling will minimize injuries and discomfort for both patient and EMT-A. This lesson includes principles of moving patients; types, uses and distinguishing features of stretchers; practice in lifting and moving patients with and without suspected spine injuries; and practice in loading and unloading amublances.

Objectives

At the conclusion of Lesson #25, the instructor will have provided sufficient information, demonstration and practice to the student, to ensure his/her ability to:

- Perform the following:
  - —A direct 2 man lift of a patient from the ground and position him/her on a stretcher.
  - —Immobilize the neck and spine of a patient using a short back board.
  - —Immobilize a patient on a long back board and move to a stretcher.
- Define a triage
- List 3 patients who would fall under each triage category

Overview of Lesson Contents

GENERAL CONSIDERATIONS

In general, a patient should not be moved until he is ready for transportation to a hospital. All necessary emergency care should be provided first.

A patient should be prematurely moved only if there is an immediate danger to him or others if he is not moved, such as:

There is fire or danger of fire.

Explosives or other hazardous materials are involved.

It is impossible to protect the accident scene.

It is impossible to gain access to other victims in a vehicle who need life-saving care.

If it is necessary to move a patient, the speed with which he is moved will depend on the reason for moving him, for example:

Emergency Moves are used if there is a fire, the patient will be pulled away from the area as quickly as possible.

Non-Emergency Moves are employed if the patient needs to be moved to gain access to others in a vehicle, due consideration will be given to his injuries before and during movement.

Emergency Moves

The major danger in moving a patient quickly is the possibility of aggravating spine injury and should be used only if absolutely necessary.

In an emergency, every effort should be made to pull the patient in the direction of the long axis of the body to provide as much protection to the spine as possible.

It is impossible to remove a patient from a vehicle quickly, and, at the same time, provide protection for his spine.

If the patient is on the floor or ground, he can be dragged away from the scene by tugging on his clothing in the neck and shoulder area.

It may be easier to pull the patient onto a blanket and then drag the blanket away from the scene.

Such moves are emergency moves only. They do not adequately protect the spine from further injury.

Non-emergency Moves

Generally all injured parts should be immobilized prior to movement.

All injured parts should be protected as much as possible during movement.

In order to protect himself, the EMT should use the following principles in all non-emergency moves:

Keep in mind physical capabilities and limitations and do not try to handle too heavy a load. When in doubt, seek help.

Do not attempt to lower a patient if you feel you could not lift him.

Keep yourself balanced when carrying out all tasks.

Maintain a firm footing.

Maintain a constant and firm grip.

Lift and lower by bending the legs and not the back — keep the back as straight as possible at all times; bend knees and lift with one foot ahead of the other.

When holding or transporting, keep the back straight and rely on shoulder and leg muscles; tighten muscles of the abdomen and buttocks.

When performing a task that requires pulling, keep the back straight and pull using the arms and shoulders.

Carry out all tasks slowly, smoothly and in unison with your partner.

Move body gradually; avoid twisting and jerking when conducting the various patient-handling tasks.

When handling a patient, try to keep the arms as close as possible to the body in order to maintain balance.

Do not keep muscles contracted for a long period of time.

Vehicle Moves

Lifting a patient from a vehicle will require ingenuity depending on the situation.

Patients may be completely mobile or partially mobile and thus can assist in the move.

For completely immobile patients, the rescuer will need to solicit help and move the patient as well as he can under the circumstances.

The student will have an opportunity to practice moving different types of patients from vehicles in the extrication lesson.

Stretchers

Wheeled Stretcher—the standard ambulance cot; it is designed to be rolled and is not easily lifted.

Portable Stretchers—easily lifted devices.

Stair Chairs—designed for patient-handling over stairways and through narrow halls and other confined areas.

Backboards—designed for immobilizing patients with suspected spine injuries; the short board serves as an intermediate device for immobilizing patients who are not in a position that permits direct transfer to the long board, that is, patients seated in cars.

Scoop Stretchers—designed for immobilizing patients with suspected spine injuries; patient must be supine.

Positioning the patient will be dependent upon the patient's condition.

Myocardial infarction patients should be semi-reclining.

Unconscious patients should be on their side in the coma position. Spine injury patients must be immobilized first.

Persons with suspected spine injuries should be immobilized completely.

Legs should be elevated in shock situations.

Direct, Ground Lift, No Spine Injury, Two or Three Rescuers

Rescuers line up on one side of the patient.

Rescuers drop one knee to the ground (the same knee for each rescuer).

The patient's arms are placed on his chest if possible.

The head rescuer places one arm under the patient's neck and shoulder and cradles the patient's head.

The head rescuer places his other arm under the patient's lower back.

The second rescuer places one arm under the patient's knees and one arm above the buttocks.

If there is a third rescuer, he places both arms in the waist area and the other two rescuers slide their arms up to the mid-back or down to the buttocks as appropriate.

On signal, rescuers lift the patient to their knees and roll him in toward their chests (the rescuer's backs are now straight and they are supporting the patient by their arms and chests).

On signal, the rescuers stand, move the patient to a stretcher.

To replace the patient on the ground or on a low cot, the procedure would be reversed.

Extremity Lift No Fractures (or All Fractures Splinted), Two Rescuers

One rescuer kneels at the head of the patient and one at the side by the patient's knees.

The head rescuer places one hand under each of the patient's shoulder while the foot rescuer grasps the patient's wrists.

The foot rescuer pulls the patient to a sitting position; the head rescuer assists by pushing the patient's shoulders up and supporting his back and head with his body.

The head rescuer slips his hands under the patient's arms and grasps the patient's wrists.

The foot rescuer slips his hands under the patient's knees.

Both rescuers crouch on both feet.

They stand simultaneously and move with the patient to a stretcher.

Immobilization On Short and Long Backboards

Support patient's head.

Immobilize neck with collar/blanket/sandbags.

Position board behind patient (shortboard), OR shove board beneath patient (longboard).

Pad board as appropriate and secure straps.

Assure that patient is secure.

Transfer of Patient From Bed to Cot

Direct Carry

Position cot: head end of cot at foot end of bed.

Prepare cot, remove straps etc.

Position patient, supine.

Both EMTs stand between bed and stretcher facing patient.

One EMT-A slides arm under patient's neck and cups patient's shoulder.

Other EMT-A slides hand under hip and lifts slightly.

Head end EMT-A then slides other arm under the patient's back.

Foot end EMT-A places arm underneath hips and calves.

Slide patient to the edge of bed.

Lift patient and curl towards EMT's chest.

Rotate and place patient gently onto cot.

Draw Sheet Method

Loosen bottom sheet.

Position cot, parallel and touching bed.

Prepare cot: adjust cot height, lower rail, remove straps.

Reach across cot.

Grasp sheet at patient's head, chest, hips and knees.

Slide patient gently onto cot.

Similar methods can be used if the patient is on a spine board or without any device underneath the patient (slide transfer).

Maneuvering the Stretcher

Rolling is the preferable method but is restricted to smooth terrain.

When rolling, the foot ends should go first.

Maintain control with an EMT-A at the foot and one at head.

Carrying methods:

End to end.

Preferable in narrow spaces.

Limited to level or moderate terrain.

Easily unbalanced.

Requires strength.

EMTs face each other.

Side carry.

More stable.

Additional personnel.

Safer over rough terrain.

Used in wheeled cot into loading ambulance.

Loading the Ambulance

Identify potential patient needs, e.g., airway problems. Select proper position in the ambulance based on needs.

Load hanging stretchers first and then,

Load wheeled stretchers.

Use sufficient manpower in lifting and positioning to ensure safety of the patient and EMTs.

Make certain all cots and patients are secured before moving ambulance.

Triage

Triage means sorting multiple casualties into priorities for emergency care or for transportation to definitive care.

Priorities are usually given in three levels as follows:

Highest Priority

Airway and breathing difficulties.

Cardiac arrest — sufficient personnel permitting. Do not tie up manpower for extended periods of resuscitation if numerous other patients need assistance.

Uncontrolled or suspected severe bleeding.

Severe head injuries.

Severe medical problems—poisonings, diabetic complications, cardiacs.

Open chest or abdominal wounds.

Shock.

Second Priority

Burns

Major or multiple fractures

Back injuries with or without spinal cord damage.

Lowest Priority

Fractures of other injuries of a minor nature.

Obviously mortal wounds where death appears reasonably certain.

Obvious dead.

Procedures in situations requiring triage.

Most knowledgeable EMT-A arriving in first ambulance must become triage officer.

A primary survey should be completed on all patients first. Correct immediate life-threatening problems.

Call for additional assistance if needed.

Assign available manpower and equipment to priority one patients.

Transport priority one patients first.

Notify hospital(s) of number and severity of injuries.

Triage officer remains at scene to assign and coordinate manpower, supplies and vehicles.

Patients must be reassessed regularly for changes in condition.

Study Suggestions

1. Using a classmate or friend as a "patient", practice the one man emergency moves covered in the lesson.

2. Working with another classmate and using a classmate or friend as a "patient", practice the direct ground lift and extremity lift.

3. If short and long backboards are available, practice immobilizing patients on the boards. Work with another classmate and use a classmate or friend as a "patient". If backboards are unavailable and no appropriate simulation object is available, practice the procedures involved in supporting the patient's head and applying a cervical collar.

4. Describe how you would position the following patients on a stretcher:

Heart attack patient.

Unconscious patient.

Patient with a suspected spine injury.

Patient in shock.

Expectant mother who is convulsing.

Lesson 26
Principles of Extrication

Introduction

The EMT-A may be the first at the accident scene and should know simple procedures for gaining access to and disentangling patients. Proper patient packaging and removal will minimize danger of further injury or aggravation of existing injuries. The lesson provides basic hints on gaining access to and disentangling patients from vehicles.

Objectives

At the conclusion of Lesson #26, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- Describe the proper methods and appropriate times to utilize the following extrication equipment:
  - —Porta power
  - —Hand winch
  - —Pry axe
  - —Air chisel (optional)
  - —Cribbing
  - —Bale Hook
  - —Hack saw
  - —Linoleum knife
  - —Screw driver
  - —Spring loaded center punch
  - —Other
- List the location of all extrication equipment on the vehicle.
- Name the agency responsible for providing extrication equipment to a scene and how and when that equipment gets to the scene.

Overview Of Lesson Contents

Basic Considerations

The Role Of The EMT:

His responsibility is to administer necessary care to the patient before extrication and to assure that the patient is removed from the vehicle in such a way as to minimize further injury.

If rescue crews are NOT present, he should be prepared to use prying and cutting tools to gain access to the patient and disentangle the vehicle from the patient.

If rescue crews are present, he should cooperate with their activities but should not allow their activities to endanger the patient.

If rescue crews are present, the EMT should attend to the needs of the patient while rescue activities proceed if possible.

Basic Principles Of Emergency Care.

Patient care precedes extrication unless delayed movement would endanger the life of the patient or rescuer. Patient care should include:

Attention to life-threatening emergencies.

Immobilization of the spine and other fractures.

Cervical and thoracic fractures should be suspected in unconscious patients.

All patients should be packaged and moved carefully to minimize danger of further injury or aggravation of existing injuries.

The Stages Of Extrication Include: Gaining access to patients, attending to life-threatening emergencies, disentanglement, preparation for removal (patient packaging) and removal.

Gaining Access includes the following steps:

Protect self

Stabilize vehicle.

Entering the vehicle through:

- Doors
- Windows
- Roof
- Floor

Stabilization Of Patient

Once access has been gained, the patient should be stabilized. Procedures are:

Primary survey.
Correct life-threatening problems.
Stabilize spine.
Note mechanism of injury.
Protect from further injury during disentanglement by:
Covering
Shielding
Pad

Disentanglement

Remove wreckage from patient, not patient from wreckage.
When opening doors, try inside handle and lock.
Use Porta-power.
Once open, widen to 90 degrees.
Three rescuers.
Hand winch.
Move seats back by: manual or electric slide control.
Remove the top by cutting posts and folding back.
Displace steering wheel and column and foot pedals.

Preparing Patient For Removal.

Maintain cervical stabilization.
Complete a secondary survey, look for mechanism of injury.
Treat all injuries appropriately. Immobilize spine securely using a:
Short spine board,
Long spine board, or
Commercial immobilization device.

Removal

Move patient not devices.
Make certain there is sufficient manpower available.
Choose the path of least resistance.
Protect the patient from sharp metal.

Study Suggestions

1. Working with another classmate and using a classmate or friend as a "patient," the student should practice packaging patients with spine and/or other injuries and removing them from vehicles.

Lesson 27
Practical Lab: Extrication

Introduction

The EMT-A is often the first trained person at the scene. In those instances his responsibilities may go beyond patient care and may include gaining access and extrication. In areas where rescue crews are not available the EMT-A may be routinely responsible for such activities. As with other skills taught in the course, practice is necessary to attain and retain proficiency.

Objectives

At the conclusion of Lesson #27, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

—Demonstrate on programmed patients, the techniques of lifting and moving of patients taught in Lesson 25 in conjunction with the principles of extrication in Lesson 26.

—Demonstrate on appropriate vehicles the techniques of gaining access to entrapped or entangled patients by use of equipment demonstrated in Lesson 26.

—Demonstrate the correct usage of short and long boards in stabilizing and removing a programmed patient from a vehicle.

Study Suggestions

1. Review all material covered in Lesson 25 and 26.
2. Practice placing fellow classmates on short and long spineboards.

Lesson 28 Test and Evaluation: Medical Emergencies, Emergency Childbirth, Environmental Emergencies, Lifting and Moving

Introduction

This lesson provides for interim evaluation of student knowledge and skills. Each student completes a written examination designed to evaluate attainment of knowledge objectives specified for Lessons 19 through 26. Each student performs each skill for an instructor and is evaluated on his performance.

Objectives

At the conclusion of Lesson #28, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

—Successfully complete a written examination reflecting the knowledge taught in Lesson 19, 20, 21, 22, 23, 24, 25 and 26 of the Basic Emergency Medical Technician: National Standard Curriculum.

—Successfully demonstrate through practical application on appropriate programmed patients or manikins, selected representative skills taught in Lessons 19, 20, 21, 22, 23, 24, 25, and 26 of the Basic Emergency Medical Technician: National Standard Curriculum.

Note: Lessons 25 and 26 may be only briefly evaluated as it is assumed proficiency was demonstrated during those lessons.

Study Suggestions

1. Review all material covered in Lessons 19 through 26.
2. Practice all skills in those lessons until proficiency is achieved.

Lesson 29
Ambulance Operations I

Introduction

This lesson provides the student with some knowledge of and familiarity with the operational aspects of the EMT's job in the area in which he will be working. It covers laws regulating operation of emergency vehicles, factors contributing to safe driving, maintaining a safe and ready vehicle, EMT-A records and reports and communication systems. Specific lesson contents will vary depending on the area in which services are provided. The lesson also includes a review of results of the written and practical examinations administered in the previous lesson.

Objectives

At the conclusion of Lesson #29, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

- Quote all laws relating to his/her operation of the ambulance and privileges in any or all of the following categories:
  - —Speed
  - —Warning lights
  - —Sirens
  - —Right-of-way
  - —Parking
  - —Turning
- List 4 contributing factors to unsafe driving conditions.
- Describe in narrative the considerations that should be given to:
  - —Requests for escorts
  - —Following an escort vehicle
  - —Intersections
- List agency contact capabilities of all two-way radio channels in the ambulance.
- List the correct radio use procedures in the following phases of a typical run:
  - —To the scene
  - —At the scene
  - —To the facility
  - —At the facility
  - —To the squad station
  - —At the squad station
- List the proper method of initiating and terminating a radio call.
- Demonstrate proper techniques in use of a radio.
- List proper sequence of delivery patient information.
- Describe what information is required in each area of the trip ticket and how it should be entered.
- Describe where trip report forms should be left and how they are used.
- List all State and/or local record and reporting requirements.

Overview Of Lesson Contents

Driving An Emergency Vehicle

Learn State and local laws, regulations or ordinances in the area relative to the operation of an emergency vehicle, including as appropriate:

Vehicle parking or standing regulations.

Procedures at red lights, stop signs and other intersections.

Regulations regarding speed limits.

Exemptions from following direction-of-movement regulations or specified turns.

Standard emergency or disaster routes.

Use of audible signals, e.g., siren.

Use of visual signals, e.g., lights.

Factors That Might Make An EMT Use Unsafe Driving Habits.

- Lack of expertise in the dispatcher.
- Inadequate equipment in the ambulance.
- Inadequate training of the EMT-A.
- Inadequate driving ability.

Factors Contributing To Safe Driving. The EMT-A must:

Be alert to changing weather and driving conditions.

Follow specified routes for routine runs but has alternate routes for contingencies.

Use extreme left-hand land on multilane highway.

Drive defensively.

Use care in exercising the right-of-way privilege.

Exercise care in use of siren.

Maintain safe following distances.

Request other emergency assistance (e.g., police) as needed.

ESCORTS and multiple vehicle responses are extremely dangerous and should be used only if unfamiliar with the location of patient or hospital.

Neither vehicle should use lights or sirens.

Provide for a safe following distance.

Intersection Accidents. These are the most common type and include:

Motorist arrives at intersection as light changes so he doesn't stop.

One emergency vehicle follows another too closely and waiting motorist is not expecting it.

Vision is obstructed by vehicles and a pedestrian may be struck.

Records and Reports

General Considerations. Information must be obtained and records maintained to:

Provide for continuity of care.

Furnish source of information for evaluating quality of care.

Provide data for analysis of causes, types and degree of illness and injury requiring emergency care.

Furnish legal evidence and EMT protection.

Provide administrative records.

Although records are important, they never take precedence over emergency care.

Record forms vary but certain information is typically obtained; for example:

Patient's name, age, sex, address.

Type of injury or nature of illness.

Mechanism of injury.

Location of patient when first seen and treatment.

Rescue measures preceding emergency care.

Findings of primary and secondary survey.

Care given at site or during transport.

Vital signs, patient's condition and changes in vital signs during transport.

Hospital to which patient was taken.

Disposition of patient's valuables.

Signature of patient or relatives if patient care is refused.

Procedures followed and disposition of patient in the event of death.

Dying statements.

Circumstances involved in homicide, suicide, rape.

Statements made by patient or others that might serve as legal testimony.

Administrative information, i.e.:

Date of call.

Time of call.

Name and telephone number of caller.

Time of dispatch.

Time of arrival at scene.
Time of leaving scene.
Time of arrival at emergency room.
Time of leaving emergency room.
Time of return to base.
Patient's insurance identification.
Name of dispatching agency.
Names of EMTs responding to the call.
Type of run to scene—emergency/routine.
Type of run to hospital—emergency/routine.

EMTs should not disturb suicide notes and safeguard homicide weapons for the proper authorities when they are not present at the scene of the emergency.

All information obtained from the patient or his surroundings should be considered confidential and should be released only to the proper authorities.

Communications

Important and Useful in the following manner:

Detection and reporting of accidents.
Assignment of calls to appropriate service providers.
Maintaining contact between the vehicle, dispatcher and hospital.
Alerting of other emergency resources.
Relating information on patient's condition and obtaining information on care of the patient.
Distributing patients among hospitals.
Alerting hospital emergency departments of type of patient being brought in.

Typical Communications. Review of typical communications equipment available and procedures used in the area. Including:

Channel and frequency allocation.
Procedures during each phase of the run.
Initiating and terminating a call.
Sequence of patient information.

Study Suggestions

1. You have loaded your ambulance with two victims of an automobile accident. One has a fractured pelvis and is in severe shock. The other is unconscious and is breathing with great difficulty. You are the driver of the ambulance. Describe all procedures you would follow until your patients are deposited at the hospital. Include communications and driving procedures.

2. Complete one copy of each report required of EMT's in your area for a simulated case. Be prepared to describe what each completed report means.

Lesson 30
Ambulance Operation II

Introduction

Certain additional non-medical roles including: vehicle inspection, equipment maintenance, traffic control and other duties are routinely assumed by EMT's. Familiarity with these roles is necessary to ensure the overall competency of the EMT-A.

Objectives

At the conclusion of Lesson #30, the instructor will have provided sufficient information, demonstration and practice to the student, to ensure his/her ability to:

- Identify all vehicle systems and equipment requiring daily inspection.
- Identify the proper storage location of all equipment carried on the ambulance.
- Describe the non-medical role of the EMT at:
  - —Traffic accidents
  - —Crime scenes
  - —Emergency Department
- List all local and State protocol to be followed during any phase of an ambulance run.
- List at least 6 of the 8 phases of an ambulance run.

Overview Of Lesson Contents

Phases of an Ambulance Run

Pre-Run: Phase 1

Vehicle maintenance.

General Considerations. The vehicle requires routine maintenance, daily inspection, and inspections after each run.

Daily Inspections. Inspection should include:

Inspection of vehicle systems

Fuel	Emergency lights
Oil	Wipers
Fluid circulation system	Horn
Battery	Siren
Brakes	Windows
Tires	Door closing and latching devices
Wheels	Communication equipment
Headlights	Power systems
Stop lights	Air-conditioning, heating and ventilating systems
Turn signals	

Inspection and inventory of emergency care equipment and supplies.

Cleanliness of exterior and interior of vehicle.

Inspections After Each Run.

There should be a sufficient supply of fuel depending on expected duration of runs.

There should be a full supply of emergency care equipment and supplies.

The interior of the vehicle and equipment and supplies should be cleaned or decontaminated as necessary.

Equipment Maintenance.

Checked and maintained.

Restocked and repaired.

Standardized placement.

Dispatch: Phase 2: should include the following:

Other pre-run considerations revolve around organization of personnel, equipment, resources and vehicles.

Central access

24 hour availability
Trained personnel
Dispatch information
Name, location and number of caller.
Location of patient.
Number of patients and severity.
Other special problems, e.g., hazardous material spill.

Enroute To The Scene: Phase 3:

Use or non-use of emergency privileges dependent upon dispatch information.
Assignment of personnel.
Assignment of projected equipment needs.

At The Scene: Phase 4

Park safely.
Identify and control hazards.
Gain access.
Provide patient care.
Prepare patient for transport.
Move to, load and secure patient in ambulance.

Enroute To The Hospital: Phase 5

Use prudent driving practices.
Additional care and monitoring of the patient.
Completion of patient forms.
Notification of hospital.
Reassuring patient.

At The Hospital: Phase 6

Transfer of patient.
Transfer of records.
Equipment exchange.

Enroute To Station: Phase 7

Advise dispatch
"Straightening up" vehicle

Post Run: Phase 8

Inspect and fill vehicle.
Inspect and restock supplies.
File reports.
Clean vehicle.
Notify dispatch.

Study Suggestions

1. Complete a daily inspection on an ambulance using a standardized form.
2. Become familiar with each compartment of the ambulance and list where each item of equipment is carried.
3. Given a simulated ambulance call, list the responsibilities you might have during each phase of the run.

Lesson 31
Situational Review

Introduction

This lesson provides the students an opportunity to apply selected knowledge and skills learned in the course by group discussion of situational examples. Suggested situations and questions to be posed are given below. The questions do not necessarily have clear-cut answers; rather they are designed to stimulate class discussion. The student should review each situation and be prepared to provide answers to the questions posed.

Objectives

At the conclusion of Lesson #31, the instructor will have provided sufficient information, demonstration, and practice to the student, to ensure his/her ability to:

—Provide in narrative an acceptable description of the functions of an EMT-A in situational examples.

Overview Of Lesson Contents

Situation #1

An ambulance is the first emergency vehicle to arrive at the scene of a two-car collision. Both cars are upright. A quick survey of life-threatening problems has revealed the following patients:

CAR 1: The driver is unconscious and seated in the front seat fastened in his seat belt. The head of the passenger in the front seat has been thrown through the windshield. He is bleeding profusely about the face, is unconscious and his respirations are shallow.

CAR 2: The driver is seated in the front seat. He is sweating and appears to be short of breath. He complains of pain in his chest and left arm. The passenger has been thrown from the car. He is lying on the road moaning that he cannot move his legs. He appears to feel no sensation in his legs.

Questions:

a. What might be wrong with each patient?
b. Which two patients (there are two EMT's) should be treated first and why?
c. What care should be given to each patient?
d. Which two patients should be transported first and why?
e. Would it be necessary to alert the hospital and why?
f. Would the trip to the hospital be made with utmost speed and why?

Situation #2

An unconscious person is found on a city street. His skin is pale and moist and his pulse is rapid. He is having convulsions.

Questions:

a. What might be wrong with the patient?
b. What should be searched for?
c. What care should be given to the patient?

Situation #3

There has been a brawl at the local tavern. One patient is lying on the floor with a knife in his chest. He is bleeding profusely and coughing up frothy blood. Patient No. 2 is unconscious, his respirations shallow, his pulse weak, and blood is dripping from his ears and nose. Patient No. 3 has an angulated compound fracture of the tibia and is bleeding profusely at the fracture site.

Questions:

a. What is most likely wrong with patient No. 1?
b. What is most likely wrong with patient No. 2?
c. Which two patients should be cared for first and why?
d. Should help be enlisted in caring for the patients?
e. What care should be provided for each patient?

f. Which two patients should be transported first and why?

g. Would it be necessary to alert the hospital and why?

h. Should the trip to the hospital be made with utmost speed and why?

Situation #4

A man has barricaded himself in the bathroom. There have been sounds of water running. When you arrive at the man's apartment, the police have just succeeded in opening the bathroom door. They tell you they have heard no sounds for five minutes. You find the patient face down in the bathtub. He is not breathing, has no pulse and his pupils are dilated and fixed.

Questions:

a. What care should be provided for the patient?

b. You have performed cardiopulmonary resuscitation on the patient for 10 minutes without reviving him. Should you cease your efforts and why?

c. What information should you obtain and to whom should you give it?

Situation #5

You are returning from the hospital and a violent thunderstorm erupts. You come across a car on which some electric wires have fallen. The driver is opening the front door of the car.

Question:

a. What should be done and why?

Situation #6

You have taped up a sucking chest wound and are transporting the patient to the hospital. You notice that the patient's respirations are worsening.

Questions:

a. What would you suspect is wrong with the patient?

b. What would you do?

Situation #7

You arrive at a private home and find a woman ranting that her husband plans to kill her and she is going to throw acid at him. You try to calm her from a distance and to keep her husband at a distance. However, he approaches her and she throws the acid in his face.

Questions:

a. What would you suspect is wrong with the wife?

b. How would you care for the husband and wife?

c. What would you do about transporting the two patients?

d. What information should you be sure to obtain and to whom should you give it?

Situation #8

You have been called to a building where there is no known elevator. There is a patient on the third floor having a severe asthmatic attack.

Questions:

a. When you leave the ambulance, what equipment should you take with you and why?

b. When you see the patient, you administer oxygen and his respirations worsen. What would you suspect is wrong and why?

c. How would you carry this person?

d. How would you care for him enroute?

Situation #9

You have been called to take a pregnant woman to the hospital to have a baby.

Questions:

a. When you leave the ambulance, what equipment should you take with you and why?

b. What questions would you ask to determine whether delivery is imminent?

c. You find the woman crowning when you arrive. What should you do to assist her in the delivery?

d. How should you care for the baby?

Situation #10

An unconscious patient has severe third-degree burns of the head, face and neck. His respirations are irregular and his pulse is weak.

Questions:

a. How would you care for the patient?

b. What percentage of the patient is burned?

Situation #11

You are following a car that veers suddenly onto the shoulder of a limited access highway, up an embankment, turns over onto its roof. You can see two people inside dangling in their seat belts and shoulder harnesses.

Questions:

a. What should be done first and why?

b. You have assured that the vehicle is shored up and stable. You find the door on the driver's side unlocked, and you open it to gain access to the victims. What should you do next and why?

c. You find each occupant unconscious. Each is breathing and has no obvious open wounds. How would you remove them from their belts and harnesses?

d. From the information presented, what might have happened to the driver? How would you check?

Situation #12

The windshield of a vehicle is smashed and the driver has a large piece of glass penetrating his left cheek and is bleeding profusely from the left cheek and forehead. He is unconscious and fastened in his seat belt.

Questions:

a. How would you care for the patient?

b. What other injuries might you suspect the patient to have and how would you check for them?

Situation #13

A car has been traveling slowly when it suddenly veers off the road, grazes a tree and comes to rest against another tree. The driver is barely conscious. He does not speak and appears to have no feeling on one side of his body.

Questions:

a. What is most likely wrong with the driver?

b. How would you care for him?

Situation #14

The drive is unconscious. He is fastened in his seat belt. There is dark red blood oozing from his mouth. The passenger in the front seat has an open fracture on the left tibia and is bleeding profusely at the fracture site.

Questions:

a. What is most likely wrong with driver?

b. Which patient would you care for first and why?

c. How would you care for each patient?

d. While you are working on these patients, you hear a moan and discover a child on the floor of the back seat. You have to remove one patient from the vehicle to gain access to the child. Which patient would you move? How would you move him?

e. The child is barely conscious and has a closed angulated fracture of the shaft of the humerus. How would you care for him?

Situation #15

Smoke is coming from a structural fire. On entering the doorway, you notice a placard displaying a radiation symbol and see a man lying on the floor 20 feet away:

Questions:

a. What environmental hazards are likely?

b. What safety precautions should be taken?

c. What modifications should be made in usual patient care and transportation?

Lesson 32
Final Written Test

Introduction

This lesson provides for final evaluation of student knowledge. Each student completes a written examination designed to evaluate attainment of knowledge objectives specified for the course.

Objectives

At the conclusion of Lesson #32, the instructor will provide and administer a written examination which allows the student to:

—Successfully complete a written examination reflecting the knowledge taught in the entire Basic Emergency Medical Technician: National Standard Curriculum.

Note: It is assumed that Lesson 32 and 33 are end of course examinations designed to determine successful course completion and eligibility for formal examination by a State or national agency for licensure or certification. Policies vary. Check with the State EMS office.

Study Suggestions

1. Review all material covered during the course.

Lesson 33
Final Practical Evaluation of Skills

Introduction

This lesson provides for final evaluation of student skills. Each student performs each skill (or a representative sampling of skills) for an instructor and is evaluated on his performance.

Objectives

At the conclusion of Lesson #33, the instructor will provide and administer a practical examination which allows the student to:

—Successfully demonstrate through practical application on appropriate programmed patients or manikins, any of the skills taught in the entire Basic Emergency Medical Technician: National Standard Curriculum.

Note: It is assumed that Lesson 32 and 33 are end of course examinations designed to determine successful course completion and eligibility for formal examination by a State or national agency for licensure or certification.

Study Suggestions

1. Review all skills and practical applications of treatment covered during the course.

Cardiopulmonary Resuscitation and Emergency Cardiac Care Performance Sheet

One and Two Rescuer CPR

Name _____ Date _____

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
1	Establish unresponsiveness and call out for help. Allow 4-10 sec. if face down and turning is required.	Tap, gently shake shoulder. Shout — "Are you OK?" Call out — "Help!" Turn if necessary, supporting head and neck.	Accurate diagnosis is important. Frequently victim will be face down. Effective external chest compression can only be provided with victim flat on back on hard surface.		
		Adequate time.	4 to 10 seconds gives time for diagnosis and to review mentally the sequence of CPR.		
2	Open airway. Establish breathlessness. (Look, listen, and feel.) (3-5 sec.)	Kneels properly.	Position for stability and access to the victim.		
		Utilize head tilt with chin lift (or head tilt with neck lift).	Airway must be opened to establish breathlessness.		
		Ear over mouth, observe chest: look, listen, and feel for breathing.	Many victims may be making respiratory efforts that are ineffective because of obstruction.		
3	Four ventilations. (3-5 sec.)	Ventilate properly 4 times and observe chest rise.	Need to expand collapsed lungs but avoid gastric distention.		
4	Establish pulselessness. Activate EMS System. (5-10 sec.)	Fingers palpate for carotid pulse on near side (other hand on forehead maintains head tilt).	The carotid pulse is the easiest to find. It is checked on the near side to avoid pressure on the windpipe.		
		Know local EMS Number and send a bystander to call EMS.	The sooner ACLS arrives the better chance for survival.		
		Adequate time.	It takes 5-10 seconds to find the right place, and the pulse may be very slow or very weak and rapid.		
5	Four cycles of 15 compressions and 2 ventilations. (54-66 sec.)	Proper rescuer body position.	Stability and access for ventilation and compression.		
		Landmark check each time.	To assure proper hand position.		
		Position of hands.	Precision in hand placement is essential to avoid serious injury.		
		Vertical compression/ no bouncing.	To achieve most pressure with least effort.		
		Says mnemonic.	Necessary to establish rhythm.		
		Proper rate and ratio.	Should attempt to accomplish 60 compressions and 8 ventilations per minute, 50% of compression is downward and 50% is upward.		
		Ventilates properly.	Adequate oxygenation must be maintained.		
6	Check for return of pulse and spontaneous breathing. (3-5 sec.)	Check pulse and breathing.	Victim's status needs to be evaluated after the first minute of CPR and every few minutes thereafter.		
7	1st rescuer resumes CPR with 2 ventilations followed by compressions.	Resume as single rescuer.	CPR must not be interrupted.		

Performance Sheet

One and Two Rescuer CPR (continued)

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
8	2nd rescuer identifies himself, checks pulse for effective compressions. (5 sec.)	2nd rescuer says, "I know CPR." Palpates carotid pulse.	Second rescuer identifies knowledge and willingness to assist. 1st rescuer accepts assistance. 2nd rescuer evaluates effectiveness of compressions.		
9	2nd rescuer calls out "Stop compressions" and checks for spontaneous pulse and breathing. (5 sec.)	2nd rescuer — 5 sec. spontaneous pulse and breathing check.	Provides a second assessment of pulse and breathing and verifies the need for continued CPR.		
10	Second rescuer ventilates once. States "No pulse. Continue CPR."	Ventilates properly and observes chest rise.	Oxygen should be delivered to the lungs prior to chest compression.		
11	First rescuer resumes compressions.	Two-rescuer rate and ratio.	2nd rescuer ventilation triggers change of rate and ratio.		
12	Minimum of two cycles of five compressions and one ventilation. (8-10 sec.) Switch and repeat until examiner is satisfied.	Correct rate of compression.	When performed without interruptions, 60 compressions per minute can maintain adequate blood flow and pressure. The rate avoids fatigue and allows optimal ventilation with quick interposition on upstroke of fifth compression.		
		Says mnemonic.			
		Interposes breath.			
		No pause for ventilations.			
13	Compressor calls for switch when needed.	Calls for switch.	Signal for change must be clear to avoid confusion.		
14	*Simultaneous switch.* Rescuer at head moves to chest.	Gives breath on 5th compression.	Switch must be performed quickly and smoothly to maintain effective CPR. Check for return of spontaneous pulse/ breathing to verify need for continued CPR. Oxygen should be delivered to the lungs prior to resuming chest compression.		
		Moves to the chest.			
		Finds correct hand position ready for chest compression.			
	Compressor moves to head.	Gives 5th compression.			
		Moves to the head. 3-5 sec. pulse check.			
		Ventilates once.			
		States, "No pulse, continue CPR."			
		Monitors compression effectiveness.	Verifies effective chest compression.		

INSTRUCTOR _____ (Check) *(S) Satisfactory ___ *(U) Unsatisfactory ___

Cardiopulmonary Resuscitation and Emergency Cardiac Care Performance Sheet

One Rescuer CPR (Heartsaver)

Name _____ Date _____

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
1	Establish unresponsiveness and call out for help. Allow 4-10 sec. if face down and turning is required.	Tap, gently shake shoulder. Shout — "Are you OK?" Call out — "Help!" Turn if necessary, supporting head and neck.	Accurate diagnosis is important. This initial call for help is to alert bystanders. Frequently victim will be face down. Effective external chest compression can only be provided with victim flat on back on hard surface.		
		Adequate time.	4 to 10 seconds gives time for diagnosis and to review mentally the sequence of CPR.		
2	Open airway. Establish breathlessness. (Look, listen, and feel.) (3-5 sec.)	Kneels properly.	Position for stability and access to the victim.		
		Utilize head tilt with chin lift (or head tilt with neck lift).	Airway must be opened to establish breathlessness.		
		Ear over mouth, observe chest: look, listen, and feel for breathing.	Many victims may be making respiratory efforts that are ineffective because of obstruction.		
3	Four ventilations. (3-5 sec.)	Ventilate properly 4 times and observe chest rise.	Need to expand collapsed lungs but avoid gastric distention.		
4	Establish pulselessness. Activate EMS System. (5-10 sec.)	Fingers palpate for carotid pulse on near side (other hand on forehead maintains head tilt).	The carotid pulse is the easiest to find. It is checked on the near side to avoid pressure on the windpipe.		
		Know local EMS Number and send a bystander to call EMS.	The sooner ACLS arrives the better chance for survival.		
		Adequate time.	It takes 5-10 seconds to find the right place, and the pulse may be very slow or very weak and rapid.		
5	Four cycles of 15 compressions and 2 ventilations. (54-66 sec.)	Proper rescuer body position.	Stability and access for ventilation and compression.		
		Landmark check each time.	To assure proper hand position.		
		Position of hands.	Precision in hand placement is essential to avoid serious injury.		
		Vertical compression/ no bouncing.	To achieve most pressure with least effort.		
		Says mnemonic.	Necessary to establish rhythm.		
		Proper rate and ratio.	Should attempt to accomplish 60 compressions and 8 ventilations per minute, 50% of compression is downward and 50% is upward.		
		Ventilates properly.	Adequate oxygenation must be maintained.		
6	Check for return of pulse and spontaneous breathing. (3-5 sec.)	Check pulse and breathing.	Victim's status needs to be evaluated after the first minute of CPR and every few minutes thereafter.		
7	Resume cycles with 2 ventilations followed by compressions.	Continue CPR in absence of spontaneous pulse/respirations.	CPR should be continued until victim responds or rescuer is relieved or exhausted.		

INSTRUCTOR _____ (Check) *(S) Satisfactory ___ *(U) Unsatisfactory ___

Cardiopulmonary Resuscitation and Emergency Cardiac Care Performance Sheet

Infant Resuscitation

Name _____ Date _____

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
1	Establish unresponsiveness and call out for help (including turning). (4-10 sec.)	Tap, gently shake shoulder, and see if infant responds. Call out — "Help!" Turn if necessary.	Diagnosis must be equally accurate in children and infants. With this emotionally charged situation, time must be taken to establish the diagnosis of unresponsiveness or breathing difficulty.		
		Infant horizontal.	Horizontal position aids effective circulation.		
		Adequate time.	4-10 seconds gives time for diagnosis and to review mentally the sequence of CPR.		
2	Open airway. Establish breathlessness. (Look, listen, and feel.) (3-5 sec.)	Tip head back. Do not hyperextend.	Hyperextension can collapse trachea or cause cervical spine injury.		
		Put ear over mouth and look toward chest to look, listen and feel for breathing.	Many victims may be making respiratory efforts that are ineffective because of obstruction.		
3	Four ventilations. (3-5 sec.)	Cover mouth and nose, give 4 breaths in rapid succession, enough to observe chest rise.	Lung capacity of infant smaller than adult, more pressure is required. Avoid over-inflating to prevent gastric distention.		
4	Establish pulselessness and activate EMS System. (5-10 sec.)	Fingers palpate for brachial pulse in infant.	Brachial pulse easier to feel in infant than cartoid.		
		Know local EMS number and send a bystander to call.	The faster ACLS arrives the better the chance for survival.		
5	10 cycles of 5 compressions and 1 ventilation. Continue uninterrupted. (30 sec.)	Two fingers on midsternum for compressions at rate of 100 compressions per minute.	Infants (rate of 100/min) need a more rapid chest compression rate with breaths interposed every 5 compressions.		
6	Check for return of spontaneous pulse and breathing. (3-5 sec.)	Check pulse and breathing properly.	Frequent reassessment of the victim's condition is necessary.		

INSTRUCTOR _____ (Check) *(S) Satisfactory ___ *(U) Unsatisfactory ___

Cardiopulmonary Resuscitation and Emergency Cardiac Care Performance Sheet

Complete Airway Obstruction

Name _____ Date _____

Part I—Conscious Victim (Sitting or Standing)

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
1	Rescuer asks: "Can you speak?" (2-3 sec.)	Rescuer must identify complete airway obstruction by asking victim if he is able to speak.	It is essential to recognize the signs and take immediate action. If the victim is able to speak or cough effectively, do not interfere with his attempts to expel the foreign body.		
2	4 Back Blows** (3-5 sec.) *Do not apply actual back blows to other students.*	Deliver 4 sharp blows rapidly and forcefully to the back between the shoulder blades; support the victim's chest with other hand.	Back blows may have the effect of dislodging the foreign body. Chest support is necessary to prevent the victim from falling forward. Whenever possible, the victim's head should be lower than his chest to make use of the effect of gravity.		
3	4 Abdominal Thrusts (4-5 sec.) OR	Stand behind victim and wrap your arms around his waist. Grasp one fist with your other hand and place thumb side of your fist in the midline between the waist and ribcage. Press fist into abdomen with quick inward and upward thrusts.	Manual thrust maneuver should move the foreign body upward in the airway. Each back blow or manual thrust should be delivered with the intent of relieving the obstruction.		
	4 Chest Thrusts (4-5 sec.) *Do not apply actual manual thrusts to other students.*	Stand behind victim and place your arms under victim's armpits to encircle the chest. Grasp one fist with other hand and place thumb side of fist on breastbone. Press with quick backward thrusts.	Chest thrusts are more easily delivered than are abdominal thrusts when the abdominal girth is large, as in gross obesity or in advanced pregnancy.		
4	Repeat above sequence until successful. (Steps 2-3)	Alternate the above maneuvers in rapid sequence until successful or the victim becomes unconscious.	Time is of the essence; the two techniques are rapidly repeated alternatively until obstruction is relieved or unconsciousness occurs.		

CONTINUED ON OTHER SIDE

Performance Sheet

Complete Airway Obstruction

Part II—Victim Who Becomes Unconscious

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
1	Position the victim and call for help. Allow 4-10 sec. if face down and turning is required.	Turn victim supine if necessary. Call out for help. Support head and neck.	Initial call is to alert bystander. Victim must be properly positioned in case CPR is required. Support head/neck to prevent injury.		
		Adequate time.			
2	Open airway and attempt to ventilate. (3-5 sec.) (Repositioning of the head and a second attempt to ventilate is optional and acceptable.)	Kneel properly—utilize head tilt with chin lift (or head tilt with neck lift). Attempt ventilation. (Airway still obstructed.)	Lack of oxygen or falling and jarring motion may loosen foreign body enough to permit ventilation.		
3	Activate EMS System. (2 sec.)	If second person is present he should activate EMS System. Know local EMS number.	Advanced life support capability may be required.		
4	4 Back Blows** (4-6 sec.) *Do not apply actual back blows to other students.*	Roll victim toward you, using your thigh for support. Give 4 forceful and rapidly delivered blows to back between shoulder blades.	Continually check for success. Each back blow or manual thrust should be delivered with the intent of relieving the obstruction.		
5	4 Abdominal Thrusts (5-6 sec.) OR	Position yourself with your knees close to victim's hips. Place heel of one hand in the midline between the waist and ribcage and second hand on top. Press into abdomen with quick inward and upward thrusts. This maneuver may be done astride the victim.	Kneeling at victim's side gives the rescuer greater mobility and access to the airway. The sequence of back blows and abdominal thrusts is more effective than either method when used alone.		
	4 Chest Thrusts (5-6 sec.) *Do not apply actual manual thrusts to other students.*	Same hand position as that for applying external chest compression. Exert quick downward thrusts.	Chest thrusts are preferred in the presence of large abdominal girth (advanced pregnancy and obesity). Quick downward thrusts generate effective airway pressures.		
6	Check for foreign body using finger sweep. (6-8 sec.)	Turn head up, open mouth with jaw-lift technique and sweep deeply into mouth along cheek with hooked finger. May need to remove dentures.	A dislodged foreign body may now be manually accessible if it has not been expelled. Dentures may need to be removed to improve fingersweep.		
7	Attempt to ventilate. (3-5 sec.)	Utilize head tilt with chin lift (or head tilt with neck lift). Attempt ventilation. (Airway still obstructed.)	By this time another attempt must be made to get some air into the lungs.		
8	Repeat above sequence until successful. (Steps 4-7)	Alternate the above maneuvers in rapid sequence until successful.	Persistent attempts are rapidly made in sequence in order to relieve the obstruction.		

**NOTE: Although the above sequence of back blows followed by manual thrusts is preferred, the reverse sequence of manual thrusts followed by back blows is acceptable.

INSTRUCTOR _____ (Check) *(S) Satisfactory ___ *(U) Unsatisfactory ___

Cardiopulmonary Resuscitation and Emergency Cardiac Care Performance Sheet

Obstructed Airway Unconscious Victim, Supine

Name _____ Date _____

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
1	Establish unresponsiveness and call out for help. Allow 4-10 sec. if face down and turning is required.	Tap, gently shake shoulder. Shout — "Are you OK?" Call out — "Help!" Turn if necessary, supporting head and neck.	Accurate diagnosis is important. This initial call for help is to alert bystanders. CPR can only be performed with victim supine on firm flat surface.		
		Adequate time.			
2	Open airway. Establish breathlessness. (Look, listen, and feel.) (3-5 sec.)	Kneels properly.	Position for stability and access.		
		Utilize head tilt with chin lift (or head tilt with neck lift).	Airway must be opened to establish breathlessness.		
		Ear over mouth, observe chest: look, listen, and feel for breathing.	Many victims may be making respiratory efforts that are ineffective because of obstruction.		
3	Attempt to ventilate. (3-5 sec.)	Attempt ventilation. (Airway obstructed.)	An attempt must be made to get some air into the lungs.		
4	Reattempt ventilation. (3-5 sec.)	Reposition head, (airway remains obstructed)	Improper head tilt is most common cause of airway obstruction. Airway obstruction is confirmed and assumed to be a foreign body.		
5	Activate EMS System. (2 sec.)	If a second rescuer is present, he should activate the EMS System. Know local EMS number.	Advanced life support capability may be required.		
6	4 Back Blows** (4-6 sec.) *Do not apply actual back blows to other students.*	Roll victim toward you, using your thigh for support. Give 4 forceful and rapidly delivered blows to back between shoulder blades.	Continually check for success. Each back blow or manual thrust should be delivered with the intent of relieving the obstruction.		
7	4 Abdominal Thrusts (5-6 sec.) OR	Position yourself with your knees close to victim's hips. Place heel of one hand in the midline between the waist and ribcage and second hand on top. Press into abdomen with quick inward and upward thrusts. Maneuver may be done astride victim.	Kneeling at victim's side gives the rescuer greater mobility and access to the airway. The sequence of back blows and manual thrusts is more effective than either technique when used alone.		
	4 Chest Thrusts (5-6 sec.) *Do not apply actual manual thrusts to other students.*	Same hand position as that for applying chest compression. Exert quick downward thrusts.	Chest thrusts are preferred in the presence of large abdominal girth (advanced pregnancy and obesity). Quick downward thrusts generate effective airway pressures.		
8	Check for foreign body using finger sweep. (6-8 sec.)	Turn head up, open mouth with jaw-lift technique and sweep deeply into mouth with hooked finger of other hand. May need to remove dentures.	A dislodged foreign body may now be manually accessible if it has not been expelled. Dentures may need to be removed to improve fingersweep.		
9	Attempt to ventilate. (3-5 sec.)	Utilize head tilt with chin lift or head tilt with neck lift. Attempt ventilation. (Airway remains obstructed.)	By this time another attempt must be made to get some air into the lungs.		
10	Repeat above sequence until successful (Steps 6-9)	Alternate the above maneuver in rapid sequence until successful.	Persistent attempts are rapidly made in sequence to relieve the obstruction		

**NOTE: Although the above sequence of back blows followed by manual thrusts is preferred, the reverse sequence of manual thrusts followed by back blows is acceptable.

INSTRUCTOR _____ (Check) *(S) Satisfactory ___ *(U) Unsatisfactory ___

Cardiopulmonary Resuscitation and Emergency Cardiac Care Performance Sheet

Complete Obstruction Conscious Choking Infant

Name _____ Date _____

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
1	Rescuer checks for airway obstruction. (2-3 sec.)	Rescuer must identify complete obstruction by looking, listening and feeling for ventilation and for blueness of the lips.	The presence of complete airway obstruction must be properly diagnosed before proceeding with treatment.		
2	4 Back Blows. (3-5 sec.)	While supporting the head, the infant is straddled over the rescuer's arm with the head lower than the trunk. The 4 back blows are delivered rapidly and forcefully between the shoulder blades.	Back blows when used alone may relieve the obstruction. Each blow should be delivered with the intent of relieving the obstruction.		
3	4 Chest Thrusts. (3-5 sec.)	While supporting the head, the infant is sandwiched between 2 hands, turned onto the back, and the thrusts are delivered in the midsternal region in the same manner as external chest compression. The head is lower than the trunk.	The combination of back blows and chest thrusts is superior to one technique when used alone. Abdominal thrusts are not recommended in infants because of the potential injury to the abdominal organs.		
4	Repeat above sequence until successful. (Steps 2-3)	Repeat above maneuvers until successful or the infant becomes unconscious.	Time is of the essence. The two techniques are rapidly repeated alternatively until obstruction is relieved or unconsciousness occurs.		

INSTRUCTOR _____ (Check) *(S) Satisfactory ___ *(U) Unsatisfactory ___

Cardiopulmonary Resuscitation and Emergency Cardiac Care Performance Sheet

Complete Obstruction Choking Infant Who Becomes Unconscious— Or Is Found Unconscious

Name _____ Date _____

STEPS	ACTIVITY AND TIME (Seconds)	CRITICAL PERFORMANCE	RATIONALE	*S	*U
1	Establish unresponsiveness. Call for help. Turn victim. (4-10 sec.)	Gently shake, tap, call out for help. Turn infant horizontal and supine. Support head and neck.	An accurate diagnosis of unresponsiveness must be made before resuscitation begins or continues.		
2	Open airway. Establish breathlessness. (Look, listen, and feel.) (3-5 sec.)	Tip head back, do not hyperextend. Rescuer looks toward chest with ear over mouth to look, listen and feel for breathing. Utilize head tilt-chin lift (or head tilt-neck lift).	Hyperextension of the head can collapse the trachea or cause cervical spine injury in the infant. An accurate diagnosis must be made to establish the presence of cardiopulmonary arrest or airway obstruction.		
3	Attempt to ventilate. (3-5 sec.)	Ventilate (airway obstructed).	An attempt must be made to get some air into the lungs.		
4	Reattempt to ventilate. (3-5 sec.)	Reposition the head. (Airway obstructed.)	Improper head tilt is the most common cause of airway obstruction. Airway obstruction is confirmed and is assumed to be a foreign body.		
5	Activate EMS System. (2 sec.)	If a second rescuer is present he should activate the EMS System. Know local EMS number.	ALS capability will be needed.		
6	4 Back Blows. (3-5 sec.)	While supporting the head, the infant is straddled over the rescuer's arm with the head lower than the trunk. The 4 back blows are delivered rapidly and forcefully between the shoulder blades.	Back blows when used alone may relieve the obstruction. Each blow should be delivered with the intent of relieving the obstruction.		
7	4 Chest Thrusts. (3-5 sec.)	While supporting the head, the infant is sandwiched between 2 hands, turned onto the back, and the thrusts are delivered in the midsternal region in the same manner as external chest compression. The head is lower than the trunk.	The combination of back blows and chest thrusts is superior to one technique when used alone. Abdominal thrusts are not recommended in infants because of the potential injury to the abdominal organs.		
8	Tongue-Jaw Lift. (6-8 sec.)	Thumb in victim's mouth over tongue. Lift tongue and jaw forward with fingers wrapped around lower jaw. Remove foreign body *if visualized*.	Blind finger sweeps are to be avoided in the infant since the foreign body can easily be pushed back and cause further obstruction.		
9	Attempt to Ventilate. (3-5 sec.)	Ventilate (airway remains obstructed).	An attempt must be made to get air into the lungs.		
10	Repeat above sequence until successful. (Steps 6-9)	Alternate the above maneuvers in rapid succession until successful.	Persistent attempts are rapidly made in sequence to relieve the obstruction.		

INSTRUCTOR _____ (Check) *(S) Satisfactory ___ *(U) Unsatisfactory ___

Appendix B
Bibliography

The Primary Medical References Used In The Development Of This Instructor's Lesson Plan

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Note: The listing of references does not imply approval or endorsement by the Department of Transportation. Check with the State EMS office for a list of approved textbooks.

Appendix C
In-hospital Clinical Guidelines

Basic Emergency Medical Technician: National Standard Curriculum In-Hospital Clinical Guidelines

Note: All of the following are to be carried out under the supervision of a Registered Nurse on that unit or the patient's physician in accordance with hospital policy.

I. Tour the Emergency Room, Intensive Care Unit, Operating Room, and Maternity Unit. Obtain and record at least one set of vital signs in each of the above named areas of the hospital.

Vital signs include: Blood pressure.
Pulse.
Respirations.
Temperature.

II. The following can be completed under supervision when the opportunity presents itself.

A. Obtain and record neurological signs (level of consciousness, pupil reaction to light, grip).

B. Observe an intravenous line being started and see how it is secured in place.

C. Observe the administration of an injection.

D. Administer oxygen to a patient.

E. Accompany a patient to a specific procedure (example: X-ray, physical therapy, etc.)

III. The following objectives are for the specific units indicated.

A. Emergency Room (P.M. shift recommended)

1. Observe the unloading procedure of a patient from an ambulance.
2. Observe the care given to a patient with chest pain.
3. Observe and participate in the cleansing and bandaging of wounds.
4. Observe and participate in the application of a cast.
5. Observe and participate in techniques used in transferring a patient from an ambulance cot to an Emergency Room cart.
6. Accompany an Emergency Room staff member in transporting a patient to his room for admission to the hospital.
7. Observe the care given to a patient in one of the following types of shock:
   a. Hypovolemic.
   b. Respiratory.
   c. Cardiogenic.
   d. Psychogenic.
   e. Neurogenic.
   f. Metabolic
   g. Septic.
8. Interact with patient and relatives and friends of the patient brought into the Emergency Room. Observe their behavior in the situation.
9. Observe the history-taking techniques of an Emergency Room patient by a Registered Nurse twice and follow through by initiating the history taking the third time, under supervision.
10. Observe and participate in the proper technique of physical assessment.

B. Operating Room.

1. Observe at the surgeon's discretion, in at least one surgical.
2. Observe the implementation of the sterile technique.

C. Maternity Unit.

1. Labor Room—Time the duration of a contraction.
2. Labor Room—Listen to the fetal heart tones before, during and after a contraction.
3. Observe one complete delivery, including post-partum care of the mother.
4. Observe the procedures of suctioning of the newborn.

5. Observe the care of the umbilical cord.

6. Observe and participate in the proper technique of a physical assessment of the newborn.

D. Intensive Care

1. Observe and participate in maintenance of the airway.
2. Observe and participate in assessing patients for:
   a. Heart sounds.
   b. Breath sounds.
   c. Shock.
   d. Signs of heart failure.
   e. Abdominal problems.
   f. Full bladder.
3. Observe and participate in the admission of a patient.
4. Observe and ask questions as to the interpretation of the heart monitor.
5. Interact with the patient and the relatives and friends of the patient.

*__Note:__ In situations where these activities are not achievable in a reasonable period of time, programmed patient simulations or other activities may be used to ensure student competency.

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